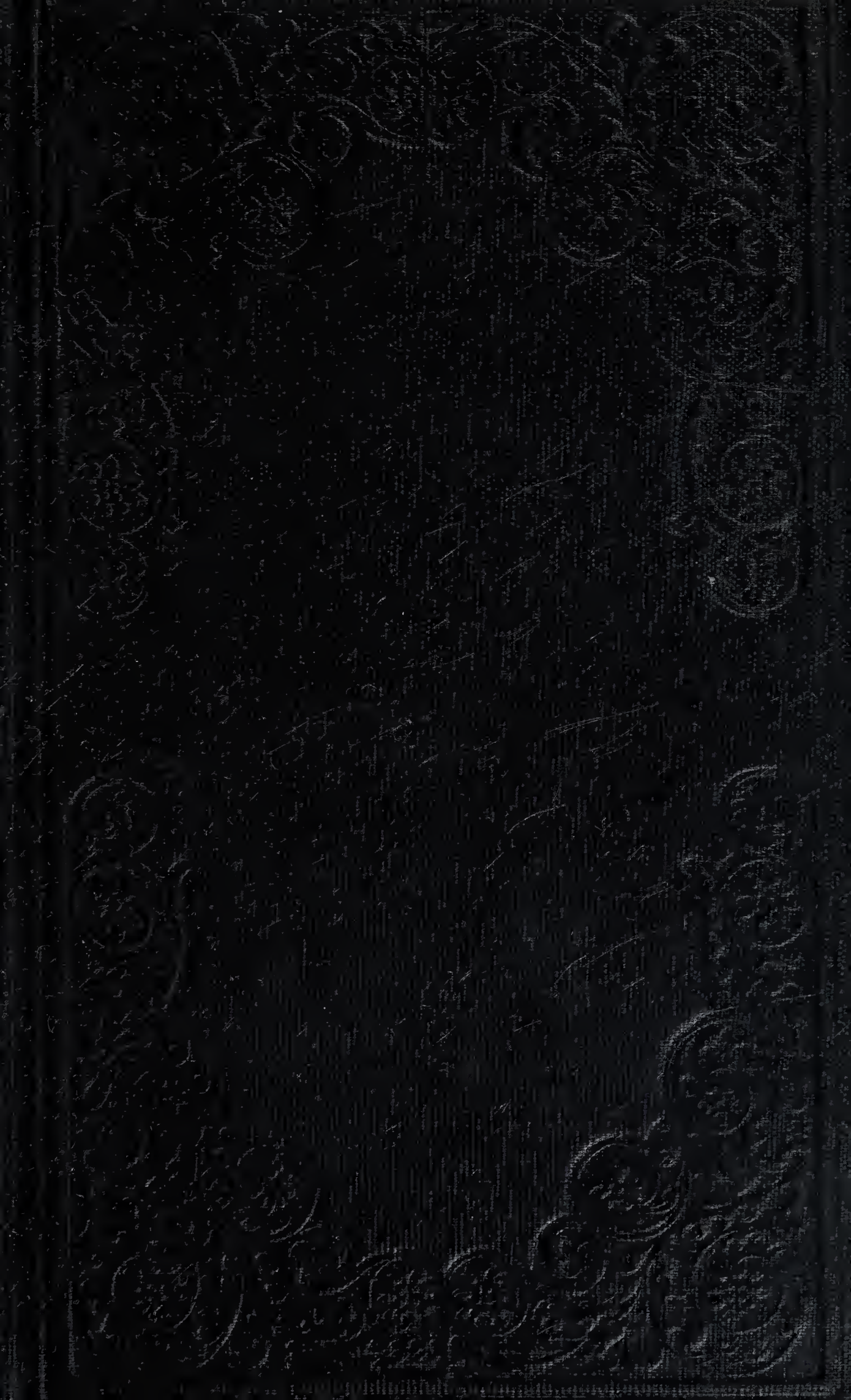

BRAITHWAITE'S RETROSPECT.

VOL. LXVII. JANUARY—JUNE, 1873.

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THE

RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

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SYNOPSIS,

(ARRANGED ALPHABETICALLY), CONTAINING

A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME, SHOWING AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE HALF-YEAR.

AFFECTIONS OF THE SYSTEM GENERALLY.

ACUTE RHEUMATISM.—The remarkable power possessed by veratrum viride of reducing the strength and frequency of the pulse renders it a remedy of the greatest value in the treatment of acute rheumatism. Two minims of the tincture should be given every hour. (Dr. W. Carter, p. 396).

BLOOD POISONING.—*Large Doses of Quinine.*—Quinine in large doses, as five grains every three hours, is a remedy by means of which we may tide the system over some period of extreme danger from blood poisoning with its attendant exhaustion of the vital powers. A farmer had been poisoned by means of a cut received during the post-mortem examination of a cow. He was evidently rapidly getting poisoned. His pulse was very small and weak, his arm was much swollen, and the axillary glands enlarged. Quinine was given in the doses recommended, and by the following afternoon he was out of danger. (Mr. N. Alcock, p. 25.)

CANCEROUS SORES.—*Chlorate of Potash.*—Chlorate of potash locally applied in cancerous sores has a great power in rendering them healthy, and even promoting their healing. It should first be applied in the form of powder sprinkled over the sore, which is then to be covered with a wet compress. The crystals are more powerful than the powder, but as they excite greater pain, they should not be used at first. Cases are mentioned in which actual healing of cancerous sores was effected by this treatment. (Dr. Burow, p. 397.)

Rodent Cancer.—Do not think too lightly of small hard pimples and warts on the face in persons advanced in life, but promptly and thoroughly excise them, especially if they show a tendency to grow, ooze, and scab. Nitrate of silver only irritates. If the wart is so irregular or so situated that it is impossible to thoroughly excise it, the parts not reached with the knife should be burnt with a hot iron and have

applied to them freely the chloride of zinc paste. Rodent cancer differs from other forms of cancer in its limited diffusibility; it infects slowly and only continuously the tissues around it, and its whole course is free from that remarkable upspringing of secondary knots from the infection of the lymphatic glands and distant viscera which characterise scirrhous cancer. (Mr. J. W. Hulke, p. 30.)

Cholera.—*Transfusion of Milk.*—The author has practised the transfusion of milk, freshly drawn from a cow, into the veins of two patients in a state of collapse from cholera. The effect after injecting fourteen ounces in the first case was rapid recovery, the purging and vomiting ceasing at once, and the pulse returning to the wrist. The milk was injected into a vein of the arm by means of a simple syringe. The syringe and bowl for the milk were heated to the temperature of 100°. (Dr. E. M. Hodder, of Toronto, p. 14.)

Enteric and Scarlet Fevers.—*The Relation between them.*—There is a certain relationship between scarlet and enteric fevers. There is the same tendency to intestinal mischief in scarlet as in enteric fever, but perhaps less marked, still both the solitary and agminated glands are inflamed. The stools have the same characters in the latter stages of both fevers. Rose papules if carefully looked for are not unfrequently found in scarlet fever. When they are unusually well formed and distinct they may even be distinguished when the scarlatinal rash is still vivid. Although typical cases may appear perfectly distinct there are some cases which, on our first seeing them, we at once pronounce enteric fever, yet a medical man a few days before would have called the same case scarlet fever. These cases are best distinguished as "abdominal scarlatina." (Dr. J. Harley, p. 8.)

Lumbago and Rheumatism.—Actæa is a most useful drug in the treatment of chronic and sub-acute rheumatism and lumbago. Out of fourteen cases of lumbago eleven were cured, and out of fifteen cases of chronic and subacute rheumatism eleven were cured. The actæa should be given in doses of half a drachm three times a day. In the case of two children the dose was ♏ x and ♏ xx, respectively increased to ♏ xx and ♏ xxx. Giddiness, headache, nausea, and irregular pulse are the symptoms produced by an overdose. The tincture should be freshly prepared. It is of no use in cases of gout. (Mr. J. J. H. Bartlett, p. 23.)

Scarlet Fever.—*Carbonate of Ammonia.*—Never give emetics, nor aperients, nor bleed, nor use leeches, nor do anything to lower the powers of life, but give carbonate of ammonia on

the very onslaught of the disease, the earlier the better. Two grains is a proper dose for a child two years of age, four grains for one four years of age, and ten or twelve grains for one of sixteen years of age. It should be given in distilled or cold boiled rain water, every two, four, or six hours, according to the severity of the throat symptoms. The quantity of water to be regulated according to the same principle. The worse the throat the stronger the dose of ammonia, the smaller the quantity of water, and the more frequently given. If the powers of life are at a low ebb, give a little wine or brandy in addition (Mr. G. J. S. Camden, p. 11.)

AFFECTIONS OF THE NERVOUS SYSTEM.

CHOREA.—Give the patient a sufficiency of good plain wholesome food. Keep her in bed, in order that the muscular and nervous system may have the greatest attainable repose, and thus prevent wear and tear. This also secures a uniform warm temperature. Prescribe two tablespoonfuls of compound decoction of aloes twice or thrice a day if there is constipation. This is all that is necessary in many cases, but if improvement is not going on satisfactorily, give sulphate of zinc in dozes of two or three grains three times a day in water, and increase the dose until each dose produces slight nausea. Smaller doses than these are inoperative, and it is surprising sometimes what large doses are required before this practical test is produced. (Dr. F. W. Wade, p. 48.)

HEADACHE.—*Ergot.*—Opium produces hyperæmia of the brain, hence it is quite unsuitable for most cases of headache. If combined, however, with extract of ergot, which counteracts that tendency, it has a most happy effect in many cases otherwise not admitting of relief. (Dr. R. Silver, p. 41.)

MIGRAINE.—"Sick headache" is a neuralgic affection, usually of the fifth nerve, and belongs essentially to the period of bodily development. It most frequently occurs in patients among whose ancestors epilepsy has existed. The best plan to cut short an attack is to place the patient's feet in hot water and mustard, letting him inhale the steam that rises. Drowsiness is often produced by this, and on lying down the patient will feel inclined to sleep. It is admissible to assist this feeling by a dose of chloral, but unfortunately this cannot always be tolerated by the stomach. If, however, this is not successful, or is not thought advisable, the alkaloid caffeine, and the substantially identical theine, and

guaranine, are each of them calculated to produce a peculiar effect in relieving the pain. The caffeine may be administered in doses of one or two grains by the mouth, or one-half or one grain subcutaneously injected. Should these measures fail, a good extract of Indian hemp should be given in quarter or half grain doses. (Dr. F. E. Anstie, p. 33.)

Nervous Affections.—*Phosphorus.*—Phosphorus is a remedy of much use in certain nervous affections In neuralgia, complicated with migraine; in nervous break-down from overwork it may prove of service, as shown by illustrative cases. It may be given dissolved in oil or lard, and enclosed in gelatine capsules. The dose in one-thirtieth of a grain two or three times a day, after food. (Dr. W. H. Broadbent, p. 51.)

Neuralgia.—*Hypodermic Injection of Morphia.*—The hypodermic injection of morphia is as dangerous as it is effectual in neuralgia. Those who have learnt to fly to the syringe as a remedy from instant pain soon discover that in it they find also a stimulant which possesses a fascination as potent as that of alcohol. The regular use of morphia in this way sets up a periodicity in the system which actually favours the return of pain, and, moreover, during that regular use other treatment is useless. (Dr. T. C. Allbutt, p. 342.)

In cases of neuralgias and other localised pains, the following colloid is a useful application. It should be brushed lightly over the part five or six times, forming successive films. Amyl hydrid, ℥j.; collodion (B.P.), ℥j.; aconitiæ, gr. j.; veratriæ, gr. vj. (Dr. Lackerstein, p. 395.)

Paralysis.—*Hypodermic Injection of Strychnine.*—The strychnine solution should be used sufficiently concentrated. The one-twenty-fifth of a grain may be injected at first, but the dose must be rapidly increased up to one-tenth or one-eighth of a grain. When a concentrated solution is used, the effects are more local than when it is diluted. (Dr. W. Carter, Mr. Barwell, pp. 55, 57.)

Paralysis of One Limb only from Lead Poisoning.—The case of a man whose right arm only was affected with paralysis, accompanied with extreme muscular atrophy, is related. This was accounted for by the lead having been absorbed only through the right hand. The case illustrates the great benefit resulting from the use of electricity. The constant current was used daily for eight weeks: faradaic irritability then returned, and in another month of treatment with the latter both the power and the bulk of the muscles were almost completely restored. (Dr. F. E. Anstie. p. 27.)

VOLUNTARY MUSCULAR ACTION.—*Influence of the Continuous Galvanic Current.*—If a weight is held out at arm's length until the muscles are no longer able from fatigue to continue in action, and a continuous galvanic current is then passed through the painful muscles, the deltoid, biceps, and triceps, all fatigue will at once vanish. This proves that voluntary action is assisted by the electric stimulus. In the use of electricity in cases of paralysis the patient should be directed to exercise the muscles at the same time the electric current is passing through them. It will then be found that the muscles are susceptible to the stimulus of the will which before were not so. (Dr. G. V. Poore, p. 68.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

ACUPRESSURE—*A Modification of.*—The great objection to acupressure is the disturbance of the tissues caused by the "corkscrew" of wire during its withdrawal, and the consequent danger of disturbing the clot. This difficulty may be overcome by using silk ligature or catgut instead of wire. The needle is to be passed under the vessel, and its point made to emerge beyond it. A double ligature is then to be passed under the point, then brought backwards and tied in the usual surgical knot under, but a little to one side of the proximal end of the pin. Of the four ends of ligatnre three should be cut off neatly, leaving the fourth. Two loops may seem unnecessary, but it is not so; for, when only one is used, it takes such firm hold of the tissue about the vessel that, during its removal, the safety of the clot is endangered. To withdraw: first remove the pin by a gentle twisting motion; after which, the knot being liberated, the ligature can be readily pulled out. (Dr. J. C. O. Will, p. 152.)

ANEURISM.—*Aortic.*—It now seems a well established fact that aortic aneurism may be—perhaps not cured—but much benefitted by coagulation of some of the blood contained in it by means of galvano-puncture. The needle used should be insulated to within half an inch of its point by means of vulcanite. It should be passed obliquely into the aneurismal sac. A zinc plate connected with the negative pole is then to be applied to the chest-wall on the opposite side, and about three inches from the edge of the swelling, a sponge wrung out of warm salt water intervening between the plate and the skin. It may be employed for half an hour at a time. As the result of two operations, at an interval of five days it was found in one case that the tumour was smaller, and for the most part firm and solid. It was again repeated

with more marked improvement still. As it is slow coagulation we want, it is better not to employ a very strong current. (Dr. McCall Anderson, p. 154.)

Popliteal Aneurism.—Dr. Thompson, of the Tyrone Infirmary, describes a mode of applying pressure to the iliac artery in cases of popliteal aneurism by means of an apparatus which any surgeon of ordinary ingenuity can make for himself. This is peculiarly suitable to the general practitioner. The plan will be understood at a glance by referring to the woodcut at p. 151. (Dr. H. Thompson, p. 150.)

Epistaxis.—*Plugging the Posterior Nares.*—This may be done by means of a small pyramidal India-rubber bag, the point of which ends in a tube. The larger end is wrapped round a probe and introduced into position, being passed through the nares. The small bag is then inflated with air or water by means of the attached tube. A piece of inelastic tissue, let into the India-rubber at the point of juncture of the tube and ball, will enable the necessary traction to be made to occlude the posterior nares. (Dr. R. P. B. Taafe, p. 159.)

Mr. Godrich has invented an instrument which promises to considerably facilitate this operation. It consists of a small elastic bag, stretched on the end of a hollow style. It is pushed through the nasal fossa, and then dilated with iced cold water. The bag, thus dilated, is drawn well forward, and an India-rubber plug is slid along the style and firmly fixed into the anterior nares. The cohesion between this plug and the style is sufficient to hold both plugs in position; if not, a piece of string tied round the style in front of the anterior plug will ensure perfect security. The instrument is made by Messrs. Louis Blaise and Co., 67, St. James's Street. (Mr. A. Godrich, p. 160.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

Hæmoptysis.—*Ergot.*—Hæmoptysis is not unfrequently the actual cause of phthisis. The blood remaining in the delicate lung structure acts as an irritant and excites changes for which doubtless the system is prepared. It will be seen, however, from this how important it is at once to check the hemorrhage. For this purpose there is probably no remedy more effectual than forty-minim doses of the liq. ext. ergotæ every four hours. (Dr. F. E. Anstie, p. 76.)

[In these cases we have for many years been in the habit of injecting a little morphia subcutaneously. Its action is rapid, decided, and almost invariable.—Eds.]

Ergotine in doses of from half a grain to two grains injected subcutaneously is an excellent remedy in cases of hæmoptysis. The best vehicle is glycerine. (Dr. Drasche, p. 84.)

Laryngotomy.—In cases of growths within the larynx too large or too numerous to be treated in any other way, and producing such urgent symptoms that relief is imperatively demanded, we must open the larynx by an incision carefully carried along the middle line. The thyroid cartilage and the crico-thyroid membrane should first be divided, and the section should then be continued upwards through the thyro-hyoid membrane and downwards through the cricoid cartilage and upper rings of the trachea to the extent necessary in order to expose fully and completely the bulk and points of attachment of the tumour. Before reaching the vocal chords a director should be passed through between them from below upwards, and the cartilage carefully divided upon that, in order to avoid wounding the chords. The parts are divided to such an extent that any wounded vessel is at once visible and can be secured. If the cartilages are ossified, cutting forceps or strong scissors may be necessary. In most of these cases tracheotomy has been already performed to relieve the urgent dyspnœa, but if this is not the case, it should be performed as a preliminary part of the major operation described. (Mr. A. E. Durham, p. 135.)

Pseudo-Phthisis.—There are many cases which are quite indistinguishable from ordinary phthisis by their general symptoms, yet are not originally tubercular at all. They commence with a localised pneumonia, the patch of solid lung softens; a cavity may even be formed. The consequence of such breaking down of tissue in ever so small a portion of lung is that dying and dead organic matter are brought into constant relation with living structures. It has been indisputably proved that the inoculation of putrescible matter is followed by lesions indistinguishable from tubercle of the lung. Cases of this kind show how careful we should be to thoroughly cure all cases of local inflammatory mischief of the lungs before the ordinary occupations are resumed. (Dr. A. E. Sansom, p. 85.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

Cancer of the Tongue.—*Removal of the Entire Tongue by the Galvanic Ecraseur.*—There are two modes of amputation of the tongue. 1. That in which the deep attachments to the hyoid bone are separated. 2. A rather more restricted

operation, in which the wire of the écraseur is introduced through the mouth instead of through the skin under the lower jaw, as in the more serious operation. This operation is one of almost absolute safety. It may be best effected by the galvanic écraseur, which only differs from an ordinary instrument in that a current of electricity can be passed through the wire so as to heat it to redness. If the wire is tightened slowly so that it burns its way through the structures included by it, little or no hemorrhage occurs. The rule should be, the less resistance the slower the speed, and *vice versâ*, the resistance being in an inverse ratio to the vascularity. (Mr. W. Whitehead, p. 162.)

Digested Milk.—In cases of extreme emaciation, with inability of the stomach to digest food, the use of milk already digested offers the best means of supplying nutriment to the system. The following is the formula for its preparation :—Cow's (or better, for infants, asses) milk, five ounces; bullock's pepsine, five grains; dilute hydrochloric acid, thirty minims. Digest for two hours, at a temperature of 122° Fahr., by means of a water bath; after which the acid should be neutralised by the addition of twelve grains of carbonate of soda; and any slight bitterness covered by the addition of a little sugar. (Sir Wm. Jenner, Dr. W. Carter, Man. and L'pool Med. and Surg. Rep., 1873, p. 43.)

Fissure of the Anus.—In the upper part of the fissure we now and then find a little protruding polypoid growth of simple granulation-tissue springing up from the bottom of the ulcer. If that is left, a risk is run that the patient will not be cured. The growth may be clipped away with scissors, or scratched away with a knife without fear of hemorrhage. (Mr. C. Heath, p. 175.)

Hemorrhoids.—*Nitric Acid.*—It is not all cases which are suitable for this treatment. Large rounded vascular excrescences should be treated by ligature. It is in cases where, when the finger is passed into the bowel, and a peculiar velvety feel at one portion is felt, that nitric acid is required. This velvety piece of mucous membrane is exceedingly vascular, and bleeds even with the touch of the finger. Nitric acid may be used for one single pile—but for a large spongy mass it is out of the question. (Mr. C. Heath, p. 170.)

External Piles.—Make an incision into the purplish mass and turn out the clot contained in it. The incision should be made in a direction radiating from the anus. If this is not done you run a risk of suppuration, or the formation of troublesome loose folds. (Mr. C. Heath, p. 169.)

NEW HERNIA KNIFE.—Dr. Patterson, of Glasgow, describes a hernia knife which differs from Sir Astley Cooper's simply in the blunt-pointed part of the knife having a quarter turn given to it, so that the flattened point passes more readily under the stricture, while its breadth flattens and pushes the gut aside as the cutting part of the blade follows. In all cases he opens the sac. (Dr. A. Patterson, p. 166.)

PROLAPSUS ANI.—The mucous membrane simply may prolapse, or the whole rectum may come down; all the coats, the muscular, and it may be the peritoneal coat also. In such cases the peritoneal cavity has even been opened by the removal of the protruded part. If the prolapse is inveterate it must be treated by applying nitric acid in stripes down the prolapsed mucous membrane. Another plan is to remove some of the redundant skin by scissors and forceps. (Mr. C. Heath, p. 174.)

PRURITUS ANI.—A weak solution of carbolic acid (1 in 96 or 100) generally at once relieves the itching soreness. (W. B., p. 182).

Soak a small piece of marine lint in carbolic lotion, introduce a small plug of it into the anus every night, letting the remaining portion form a pad outside. It will always give great relief. (Dr. J. Thompson, p. 182.)

SPECULUM ANI.—The most convenient speculum for the anus is a bivalve one, formed of two parts connected by a simple hinge. It has this advantage, that you can fix it open at any point, and it can be turned round in any direction. It also admits of examination by the finger of the parts exposed. (Mr. C. Heath, p. 167).

AFFECTIONS OF THE URINARY ORGANS.

ACUTE BRIGHT'S DISEASE WITHOUT ALBUMINURIA.—There are cases, although they are very rare, in which there is acute Bright's disease without albuminuria. Dr. George Johnson has seen four such cases, three of which recovered, and the fourth was improving when it was lost sight of. There is structural change in the kidney in fatal cases of this kind, as proved by direct examination. No good explanation can be given. There is generally dropsy, and a low specific gravity of urine, which is small in quantity. (Dr. G. Johnson, p. 100.)

CATHETERISM.—*Selection of Positions for.*—The best position is for the patient to stand and the operator to sit. If fixity is wanted the patient can lean against some object. (Mr. W. F. Teevan, p. 213.)

DIABETES.—*Skim-milk Treatment.*—By the skim-milk treatment of diabetes, as is proved by a case related by Dr. A. S. Donkin, the disease may be radically cured. Seven or eight pints of skim-milk are to be allowed daily, divided into meals taken at regular intervals, and no other food of any kind whatever is to be taken, and no medicine is required. In one case the urine was of specific gravity 1040, and contained 27 grains of sugar to the ounce. In fifteen days the sugar had entirely disappeared, nor has it returned, although the patient has long since resumed his ordinary avocations. There was at first a considerable loss of weight, as much as fourteen pounds in twenty-eight days, notwithstanding the fact that the patient at the end of this period felt very much stronger and better. At the end of six weeks the patient was allowed solid animal food at breakfast, dinner, and supper, in addition to the skim-milk, which he drank largely at meals instead of water. Bran biscuits, gluten bread, and every conceivable variety of animal food with dry wines were by degrees added to the dietary. He was last seen in April 1872, when he was in excellent health. (Dr. A. S. Donkin, p. 90.)

Diabetic Bread.—The prohibition of bread from the diet is complained of by diabetic patients more than that of any other article of diet. Gluten bread is exceedingly insipid, and bran bread, if pure, is nothing but lignine, and therefore innutritious. A bread consisting of 80 per cent. of gluten and 20 per cent. of bran nearly free from starch, and a very small quantity of butter, does not possess these disadvantages. It is a much closer approximation to ordinary brown bread than any other substitute now in use. (Dr. A. S. Donkin, p. 99.)

GOUT AND GRAVEL.—*Lithium Salts.*—Salts of lithium are far superior to salts of potassium as remedial agents in cases of gout and gravel. Numerous trials have led Dr. Garrod to the conclusion that by means of from 20 to 30 grains of citrate of lithium the urine can be kept as full in quantity, the specific gravity as low, and the freedom from sand as great, as from the use of from 120 to 180 grains of citrate of potassium; and that when under the influence of the lithium salts no debility is experienced, whereas the lowering is often well marked when the citrate of potassium is exhibited. (Dr. A. B. Garrod, p. 216.)

LITHOTOMY.—*Removal of Foreign Bodies from the Bladder.*—What is to be done if a foreign body in the male bladder cannot be extracted through the urethra—such as a piece of bougie encrusted with salts? The median operation of

lithotomy is unquestionably the proper thing to do. There are some differences of opinion as to the best way of reaching the staff. Erichsen uses a rectangular staff in order that the exact position of the point where to enter the knife in the groove may be more easily judged of. All are agreed that the cutting edge of the knife should be directed upwards—that the first point of incision should be half an inch above the rectum, in the position the patient is in, and that the prostatic portion of the urethra should be dilated by the forefinger of the surgeon and not incised. (Dr. G. H. Porter, p. 192.)

Lithotrity in Cases of advanced Renal Disease.—Lithotrity may be performed with success in cases of advanced renal disease. Of course the suffering of the patient must be so great as to render some relief necessary. A pale, weak, and puffy-looking man suffering from advanced Bright's disease, by lithotrity obtained relief for the remaining nine months of his life. The stone was a large phosphatic one. Lithotomy would have been at once fatal. (Sir H. Thompson, p. 189.)

Resina Copaiba as a Diuretic.—Copaibæ consists of an oil and a resin, and in the latter resides the diuretic properties of the drug. It is not certain invariably to act as a diuretic, but it generally does so, and the action is thus more striking than that of any other diuretic. Fifteen or twenty grains in mucilage and flavoured water should be given three or four times a day. It is particularly useful in cases of dropsy from cardiac or hepatic disease. (Dr. S. Wilks, p. 398.)

Stricture of the Urethra.—A recent stricture may generally be cured by simple dilatation by means of soft flexible conical bougies with a small bulbous extremity; but a stricture of old standing presents too much resistance for such an instrument. In these cases Sir Henry Thompson uses conical steel bougies, two sizes smaller at the point than at two and a half inches higher up. Where a stricture is very small and tight, so that a mere succession of drops is the only means by which relief is attained, the smallest gum-elastic catheter which handicraft can produce should be tried. If this can be passed it should be tied in. If this cannot be passed, a very small silver catheter should be tried. The quickest way to proceed to a cure is then to keep the patient in bed, and pass a larger instrument as its predecessor becomes loose. (Sir H. Thompson, p. 198.)

Old Indurated Strictures.—The objection to rupture by Holt's dilators is that the benefit obtained is not very enduring. The best plan by far is division by means of a urethrotome. The best is Civiale's. First see that the stricture is sufficiently dilated to admit the passage of the bulb of the instrument, and for this purpose, if necessary, tie in a small gum-elastic catheter for forty-eight hours before the operation. The bulb of the instrument being passed through the stricture, the small knife is started from its groove and made to cut along the floor of the urethra by slowly withdrawing the instrument. Do not fear a complete and free incision, and press the blade firmly against the opposing stricture. Next introduce a No. 13 plated sound, which should go quite easily into the bladder, and then, on withdrawing it, pass a No. 11 or 12 gum-elastic catheter, well curved, so as to keep the point out of the incision. This is to be retained in the bladder eight and forty hours. (Sir H. Thompson, p. 202.)

The "Railway Catheter."—Take a No. 2 flexible catheter, cut it off at the eye, and insert a fine piece of catgut instead of stylet. Pass the catheter down to the stricture, and then cause the catgut to protrude. It is so fine and flexible it will usually pass the stricture, and the catheter may thus be run upon it into the bladder. A filiform bougie or No. 1 catheter may be substituted for the catgut. (Mr. P. J. Molony, p. 209.)

Impassable Stricture.—Do not conclude that a stricture is impassable until the perineum has been freely leeched. Four surgeons had failed to pass an instrument in a case, although the patient had been kept in bed a fortnight and freely purged; but directly blood had been removed, as recommended, a small instrument was passed into the bladder. (Mr. W. F. Teevan, p. 211.)

New Operation for the Relief of Retention of Urine from Impassable Stricture.—A stricture is funnel-shaped, with its widest end towards the bladder and its narrow end outwards. In cases of retention which cannot be relieved without operative interference, the urethra may easily be opened from the rectum and a catheter passed into the bladder. It is usually easy also to pass a small instrument forwards through the stricture itself, and make it emerge at the orifice of the urethra. This operation is rendered easy by the dilated state of the passage behind the stricture. There is no danger of producing a rectal fistula, as the wound readily heals if a catheter is frequently used. This operation is simpler and safer than perineal section. (Mr. F. Jordan, p. 205.)

Retention of Urine from Stricture or Enlarged Prostate.—In the great majority of cases relief can be obtained by placing the patient in a warm bath and injecting subcutaneously one-eighth of a grain of acetate of morphia when he is in the bath. If this fails, give a full dose of castor oil and tincture of opium, followed by another hot bath. When compelled to use instruments chloroform is of inestimable service. (Dr. G. H. B. Macleod, p. 210.)

AFFECTIONS OF THE BONES AND JOINTS, OPERATIONS, &c.

Effusion in Joints.—*Removal of by the Aspirator.*—Although some of the forms of joint effusion are transient in character and readily yield to appropriate treatment, others are obstinately persistent, or are the precursor, if not the chief factor in the production of ankylosis, or which lead to excision and amputation. In these cases the proper practice is at once to draw off the fluid by means of the aspirator. (Mr. T. R. Jessop, p. 119.)

Excision of the Elbow-joint.—A limited removal of the bones in excision of the elbow-joint is usually followed by bad results as regards the mobility of the new joint. This want of mobility, however, depends upon a gradual contraction of the muscles of the joint, resulting from their too free separation from their attachments during the operation. In cases of anchylosis without disease such free exposure and removal as is usually practised are not necessary. All that is wanted is the removal of only a portion of the lower extremity of the humerus, together with any new osseous material likely to interfere with the future mobility of the joint. This may be effected by a mode of operating described at length in the paper. (Mr. T. Annandale, p. 110.)

Talipes Varus.—For a new method of bandaging in talipes varus, to prevent the heel slipping backwards and upwards, as recommended by Mr. Frederic Clowes, see description and woodcut at p. 134.

Tapping and Exploration of Tumours and Collections of Fluid.—*Pneumatic Aspirator.*—The pneumatic aspirator is a powerful syringe, made of glass with brass mountings, or of metal with a glass tube laterally placed and connected with the interior of the syringe for the purpose of observing the nature of the contents of the syringe. There are a number

of fine tubular needles fitting on to the syringe. A vacuum must first be produced by closing the two taps and screwing or drawing up the piston to the full extent. A tubular needle must first be introduced into the tissues for about one-third of an inch, it must then be connected with the pump in which the vacuum has been established either directly or through the medium of a caoutchouc tube. The tap must then be opened between the needle and the vacuum and the needle pushed gently forward. We may thus slowly traverse the tissues, so to speak, with the vacuum in hand, until we discover the effusion, or abscess, or fluid of any kind we are in search of. The moment the needle enters the liquid the latter rushes forcibly into the instrument. (Mr. T. R. Jessop, p. 119.)

The subcutaneous injection syringe, or an instrument of similar construction, may be made of the greatest use in exploring suspected tumours, cysts, and abscesses in all parts of the body. By it the chest may be explored in pleuritic effusion, the peritoneal cavity, and various abdominal tumours and cysts. Dr. Roberts has explored the liver seven times in malignant disease of that organ, four times in cirrhotic induration, twice in albuminoid or waxy enlargement, five times in hydatid cysts of that organ, the spleen, and the kidneys, in cases of disease. In none of these cases did the smallest ill effect arise. (Dr. W. Roberts, p. 128.)

A New Mode of Tapping in Ascites.—All that is necessary is to insert a fine hollow needle, such as is used for a subcutaneous injection syringe, or better, a little larger. The needle should have attached about three and a half feet of India-rubber tubing filled with water. The syphon power thus brought into action is sufficient to empty accumulations of twenty or thirty pints in the course of some hours. It is better that a needle used for this purpose should have a cross-bar at the hilt, over which strips of adhesive plaster may be passed to keep it *in situ*. (Dr. W. Roberts, p. 130.)

AFFECTIONS OF THE SKIN.

Boils.—*Alcohol.*—As soon as the characteristic redness appears, indicative of the commencement of one of those small boils or abscesses which often so seriously impair the beauty of the face in young people, the spot should be rubbed with camphorated alcohol, the friction being continued some time. A little camphorated oil should then be applied to prevent complete evaporation. (M. Nelaton, p. 244.)

Itching and Irritation of the Skin.—*Bismuth as an External Application.*—An ointment containing bismuth in the proportion of half a drachm of the subnitrate to the ounce of simple ointment, rubbed up with a little spirits of wine, and applied freely to the skin, gives great relief in the intense itching and irritation which accompanies chronic eczema and other forms of skin disease. (Dr. McCall Anderson, p. 379.)

Skin-Grafting.—The following plan retains the graft well in its place, and yet does not necessitate the removal of the plaster to observe progress made. Cut an oval aperture in a strip of adhesive plaster sufficiently large to go across the wound and adhere well at each side of it. Place evenly and neatly on the adhesive side a shorter piece of gutta percha tissue. The whole is so to be adjusted that the graft is seen through the gutta percha tissue which closes the aperture in the adhesive plaster. (Dr. J. W. Bligh, p. 243.)

Small Abscesses and Cysts.—*Evacuation by a Subcutaneous Injection Syringe.*—Small abscesses and cysts may be easily evacuated by a subcutaneous injection syringe. This plan is particularly useful in small abscesses of the neck, when it is desirable to avoid unsightly scars. (Dr. W. Roberts, p. 129.)

Ulcers.—Take of flour, four ounces; powder of acacia, one ounce; powder of tragacanth, half an ounce; one egg; chalk, two drachms; cold water, one pint. Mix together and place on the fire in a saucepan. After boiling a minute remove, and allow to cool. It should be the thickness of ordinary paste. Let the patient paint the ulcer pretty thickly with this mixture three or four times a day, and cover with a piece of soft rag. No other treatment is to be pursued. The pot and brush used should be washed daily, and only enough material supplied to last for that one day, otherwise the contents will become sour. By this treatment a number of old ulcers in broken-down people in a workhouse infirmary were cured in from two to six weeks. The theory of the treatment is that the application nourishes locally the weakened and degenerate spots. A number of illustrative cases are given, and whatever doubt there may be as to the theory, there can be none as to the success of the practice. (Mr. P. Corwen, p. 240.)

Vaccination.—Be careful never to drain a vaccine pustule of all obtainable lymph. As soon as the first contents are exhausted the risk of drawing syphilitic virus from the blood

(supposing such to exist) begins. It is well to avoid vaccinating from children whose parents are not known to the vaccinator, and, further, to decline, for the most part, using all first-born children, waiting until, by the development of one healthy child, a guarantee of freedom from taint on the part of the parents has been given. (Mr. J. Hutchinson, p. 249.)

AFFECTIONS OF THE EYE.

Amaurosis.—*Hypodermic Use of Strychnia.*—In cases of hemeralopia, muscular asthenopia from overwork, amblyopia, and tobacco amaurosis, the hypodermic use of strychnia affords our best hope of success in treatment. It is not necessary to inject it near the organ affected, as the remedy acts only through the instrumentality of the nerve-centres and by means of the circulation. The solution used should be four grains to the ounce, each minim of course containing $\frac{1}{120}$th of a grain. Three minims should be the commencing dose, equal to the one-fortieth of a grain. If no marked symptoms ensue, the amount of the solution used should be increased daily by one minim, until a maximum dose is reached, which is frequently one-sixth or even one-fifth of a grain. (Dr. J. J. Chisolm, p. 58.)

Cataract.—It is generally acknowledged that the cornea is much more prone to take on suppurative inflammation than the opaque tissue which constitutes the border land between the cornea and sclerotic. There are, however, certain risks in this operation, but they may be avoided when they are fully recognised. The risks are—1st. Greater liability of vitreous humour to escape; 2nd. Proneness to secondary iritis; and, 3rd. Possibility of sympathetic ophthalmia. The cause of the first is usually some spasm or pressure at the moment of exit. Secondary iritis depends usually upon some bruising of the iris, and sympathetic ophthalmia is probably due to an encroachment of the section upon the ciliary nerves, and a consequent bruising of that highly sensitive tissue during the transit of the hard cataract. (Mr. G. Critchett, p. 228.)

Section of the Orbicular Muscle and Integument at the Outer Canthus.—A section of the orbicular muscle and integument at the outer canthus as a prelude to operation for cataract is of great advantage. 1. The globe is more freely exposed. 2. The spasmodic contraction of the orbicular muscle is overcome, and consequently all risk of sudden protrusion of the

lens, followed by prolapse of the iris, is avoided. 3. The contraction of the lids on the globe, which is sometimes a troublesome symptom in the after-treatment of cataract-extraction, is prevented. No sutures are required, as the divided surfaces readily unite, and scarcely leave a trace behind them. (Mr. E. Chesshire, p. 238.)

Removal of Cataract by Solution.—The experience of the late Dr. Arthur Jacob led him to treat all cataracts, with the exception of the yellow hard cataracts of elderly people, by simply breaking them up with a needle passed through the cornea. Under fifty years of age, the crystalline lens once broken in pieces must be sooner or later dissolved and absorbed. It is only a question of time. Absorption should always be preferred to operative measures for the removal of soft cataracts; the latter being in these cases very unsatisfactory. The extreme slowness of absorption, and the necessity for repeated disturbances of the eye, are, however, disadvantages which prevent the frequent selection of solution instead of the more hazardous operation of extraction. (Dr. A. H. Jacob, p. 231.)

Iritis.—*The Use of Atropine.*—The local application of atropine is alone sufficient to cure most cases of iritis. The strength of the solution is of little importance, provided it is not too weak. Four grains to the ounce is a good formula. The rule is that this should be instilled sufficiently often to dilate the pupil as quickly as possible, and this dilatation must be maintained during the whole progress of the inflammation, and even for several weeks after it has abated. For this purpose it is impossible to fix dogmatically the amount required. Warm applications are beneficial in iritis; cold applications injurious. (Mr. Leibreich, p. 379.)

Symblepharon.—*Conjunctival Transplantation from the Rabbit.*—In complete adhesion of the lid to the globe of the eye (usually the result of a burn by molten metal) all that is necessary is to restore the palpebral mucous membrane—the globe itself may be let alone. This may be done in two ways. 1. By transplanting two flaps from the conjunctiva oculi, one from either side of the cornea, twisting them, and bringing them down on to the inner surface of the eyelid. They must then be brought together in the middle line by fine sutures inserted previously to their separation from their natural place. 2. By transplanting a piece of conjunctiva from the eye of a rabbit. This has actually been twice successfully accomplished. (Dr. J. R. Wolfe, p. 220.)

MIDWIFERY, ETC.

AMENORRHŒA.—*Junod's Boot.*—Junod's boot is essentially a dry cupping on a large scale. The leg is enclosed in an air-tight case, and the air exhausted over it. The result is that for the time the capillaries and vessels of the leg enlarge, more blood remains in the limb, and the circulation in other parts is proportionately relieved. It affords a mode of treatment in cases of suppression of the menses which is not only of great promise in itself, but has the merit of not interfering with other treatment. (Dr. E. Garrett-Anderson, p. 290.)

Guaiacum.—Guaiacum in ten-grain doses, once daily, is a remedy of considerable value in ovarian amenorrhœa, i.e., to stimulate the secretion when the uterus is healthy and the ovarian action is alone required. (Prof. Cleland, of Galway, p. 347.)

CEPHALOTRIPSY.—Perforate, and then apply the blades of the cephalotribe in the same manner as the long forceps. Screw the handles together and crush the skull, then repeat the process on the portion not previously included. It only remains to extract by means of the cephalotribe, using it just like a long forceps. It may be necessary to perforate and eviscerate the thorax and abdomen, and even to crush them with the cephalotribe. It may be requisite, in order to do so thoroughly to decapitate. (Dr. J. Wallace, p. 278.)

CHRONIC ENDO-METRITIS.—*Application of Nitric Acid.*—Although fluid injections into the interior of the uterus are highly dangerous, strong caustics may without fear be applied in suitable cases. Of these, the fuming nitric acid is by far the best. In order to apply this first dilate the os and cervix very freely by tents, and then guard the cervix by a speculum contrived for this purpose (see woodcut p. 261.) The nitric acid is to be passed up by means of a stilette having a little cotton or lint rolled round it. It is seldom that any pain is caused. If the cervix is not guarded in the manner recommended contraction of its canal might ensue. This treatment is of great service in cases of profuse menstruation with rough granular membrane. In a case of chronic endo-metritis in which free dilatation of the cervix could not be done, on account of the distance of the patient's residence, ten grains of solid nitrate of silver were passed up into the interior of the uterus. A good deal of pain was caused, but the case was cured. (Dr. L. Atthill, p. 259.)

Chronic Inversion of the Uterus.—The first thing to try in chronic inversion of the uterus is sustained elastic pressure. For this purpose an inflated caoutchouc pessary in the vagina possesses several disadvantages. A better plan is to use a curved stem pessary with an elastic cup-shaped end. To the lower end of the stem are attached strong elastic tubular bands, two of which are brought up in front and two behind, to be made fast to a belt around the abdomen by bracing up the posterior bands. A forward direction is given to the elastic cup, so that the uterus is pressed up steadily upon the fundus of the vagina. If this plan does not make any impression, and the contracted os does not yield, the uterus should be pulled down outside the vulva by a noose of tape passed round it, and three shallow incisions made in the cervix, commencing at the os and extending about two-thirds of an inch downwards. The elastic pressure if now reapplied will probably succeed; if not, more forcible, but still gentle, pressure by the hand will usually succeed in returning it. (Dr. R. Barnes, p. 311.)

Fibroid Degeneration of the Cervix Uteri.—In this affection there is an increase both in length and bulk of the cervix and distinct firm nodulations are felt. The os is patulous, its lips everted, and the lining membrane congested, inflamed, and granular. There is generally leucorrhœa, which may be offensive, and more or less pain. The disease is very liable to be mistaken for cancer. By the entire removal of the morbid structure the disease may be cured. This is best effected by the cautious use of potassa fusa, after two or three applications of which the white colour of the fibroid deposit is seen contrasting strongly with the surrounding red normal tissue. Once exposed, it is pushed forward by contraction of the muscular fibres surrounding it and becomes a projection when it may be brought under the action of the potash until the whole is removed. The caustic can be used with great safety and accuracy of limit if the proper mode of doing so is adopted. (Dr. P. Smith, p. 319.)

Fibroid Tumour of the Uterus.—A fibroid tumour of the uterine wall not presenting any marked projection into the cavity, is curable by a simple incision into it from within the uterus. The capsule is divided, and the uterine fibres contract upon it and expel it in the place of least resistance—the incision. Two interesting cases illustrative of this are related. The first tumour is described as six inches long by three, the second as weighing 27 ounces. Mr. W. R. Jordan, p. 315.)

Subcutaneous Injection of Ergot.—In a case of fibrous tumour of the uterus, not admitting of surgical interference, three grains of the watery extract of ergot was administered subcutaneously for fifteen days. The result was that the tumour began to diminish in size, and five weeks after the commencement of the treatment had altogether disappeared. The extract was dissolved in glycerine. The most convenient part is the vicinity of the umbilicus. After this singularly successful case, the same treatment was adopted in nine others, and was successful in seven. (Prof. Hildebrandt, p. 289.)

Flexions of the Uterus.—Anteflexion and retroflexion are produced by the same thing, namely, a subincumbent weight pressing on an enlarged and softened organ. If the position of the uterus is high up in the pelvis, anteflexion is produced, if low down retroflexion is produced. The reason is, that the axis of the uterus is always at right angles to the plane of that part of the pelvis in which it is situated, so that a weight would press upon the anterior surface if there is a little prolapse, and upon the posterior surface if the organ occupies its normal position. (Dr. Squarey, p. 318.)

Induction of Premature Labour.—There is no plan superior in efficiency and safety to that recommended by Dr. Barnes, for the purpose of inducing premature labour. It is to introduce into the uterus, external to the membranes, a portion of gum elastic bougie about six inches in length, the remainder being coiled up in the vagina; the sole disadvantage is that it is liable to slip out. This may be prevented by attaching an air pessary to the lower extremity of the bougie. The pessary is not inflated until it has been introduced into its proper position in the vagina. There is also this advantage that the air pessary acts as a dilator on the vagina, and facilitates the subsequent delivery. (Mr. W. Whitehead, p. 268.)

Insufflator for Diseases of the Uterus.—Mr. Clay, of Birmingham, describes an insufflator which he has for some time used in diseases of the uterus with satisfaction to himself; it is a tube of the same length and shape as Simpson's sound, having an India-rubber ball at the handle. There is an aperture in the tube near the ball, into which the powder used is introduced. It is made by Messrs. Salt & Son, Birmingham. (See woodcut, p. 344.)

Intra-Uterine Medication.—It must be remembered that if the uterus is tender on pressure, any intra-uterine appli-

cation is likely to aggravate mischief instead of relieving it. The congested state must then be relieved by rest, the application of leeches, the introduction into the vagina of a pledget of cotton wool thoroughly soaked in glycerine, and other suitable means. The glycerine causes a profuse watery discharge, by exosmosis, relieving the congestion materially. (Dr. W. S. Playfair, p. 327.)

The best way of applying medicaments to the interior of the uterus in cases of chronic uterine catarrh is by means of a series of very fine probes made of soft metal, two and a half inches long, and mounted on long box wood handles. The extremity is very slightly bulbous. The flexibility of the probes is of essential importance, as it enables us to bend them to the exact shape of the uterine cavity. A small quantity of fine cotton wool is then teased out, the probe dipped in water to cause the wool to adhere, and the wool then wrapped evenly round the probe by rotating the latter while the wool is held between the finger and thumb of the left hand. The cervix is next exposed by a Ferguson's speculum and the probe, dipped in whatever solution is to be used, gently passed up into the uterine cavity. No force is to be employed. The most useful of all applications is a solution of carbolic acid in glycerine. Carbolic acid possesses certain properties which particularly recommend it for this purpose. When applied in a tolerably concentrated form it causes the tissues to shrink and mummify, but they never swell, nor is an eschar ever produced. There is no tendency to cause stricture of the uterine canal as there is when solid nitrate of silver is used. (Dr. W. S. Playfair, p. 331.)

Fluid injections into the interior of the uterus are so dangerous that their use should be restricted to urgent danger from menorrhagia. One of the most useful applications, and at the same time safe and convenient, is sulphate of zinc. It can be prepared in small cylindrical sticks, weighing three and five grains. These can be carried into the uterus by means of a silver canula, like a catheter with the end cut off. When in the proper place the zinc is ejected by means of a stilet. Nitrate of silver reduced by admixture with nitrate of potash may be used in the same way; so may persulphate of iron, but this should be considerably reduced. Almost any substance may be applied in the form of an ointment or pasma. When grease is objectionable a pasma made of glycerine and other matters may be used. (Dr. R. Barnes, p. 336.)

Seeing that dangerous symptoms not unfrequently arise from fluid injections into the uterus, it is better to employ the safe

and equally efficacious solid forms of the drugs usually used in the liquid form. Finely powdered nitrate of silver, sulphate of zinc, or perchloride of iron may be applied with the greatest ease by means of Lallemand's porte-caustique. The drug is placed in the groove of the stylet, and this is protruded and rotated on arrival within the uterine cavity. (Dr. J. Whitehead, p. 345.)

Menorrhagia.—*Sponge Tents.*—We occasionally meet with cases of menorrhagia for which there is no apparently sufficient cause—no polypus, no tumour or disease of the body of the uterus. The cervix, however, is thickened, the os patulous, and the mucous membrane soft, spongy, and granular. Often one lip is much swollen, but the one peculiar characteristic is that the mucous membrane feels loose, and can be glided a little over the subjacent structures by the finger. These cases are generally in women who have lately returned from India, or have lately had a miscarriage or delivery at full term. The hemorrhage is very uncontrollable. The local use of perchloride of iron does not suffice. The best plan is to dilate the parts with a well made sponge tent. If no gum is used in the manufacture the sponge presses evenly and firmly on all the inequalities of the mucous membrane, modifying its nutrition. Whatever the explanation may be the remedy answers the purpose. (Dr. G. G. Bantock, p. 281.)

New Midwifery Forceps.—Dr. Vacher, of Birkenhead, describes a new form of short midwifery forceps (see woodcut, p. 275). Like those described by us in 1868, the two blades lie one inside the other, and are introduced as one blade directly into the hollow of the sacrum. They are then separated and passed round the head of the child in opposite directions. The two blades are connected together firmly by a hinge joint at the handle. When brought opposite to one another they lock of themselves. The forceps are only intended to be used when the head is low down in the pelvis. It is made by Weiss and Son. (Dr. F. Vacher, p. 272.)

The Orifices of the Uterus.—The uterine sound ought not in a heathy uterus to pass through the os internum without pressure, or in other words a certain amount of force. This is owing to the physiological contraction of the circular fibres of the os internum. These fibres are not anatomically a sphincter, but they are one practically. Hence the division of them by any of the numerous instruments made for that purpose is in most cases an unscientific and useless operation. (Dr. H. Bennet, p. 307.)

The os uteri internum is actually open so as to admit the uterine sound only as a rule in morbid uterine conditions, especially where there is inflammation of the mucous membrane of either the cervix or body. A patent os internum is also found in sub-involution and in cases of fibroid tumours. In some women of very lax fibre the sound meets with no resistance, without the existence of any uterine disease. It results from all this that if we cannot pass a sound we must not suppose there is organic stricture—the contraction being physiological and quite healthy. (Dr. J. H. Bennet, p. 305.)

Lacto-phosphate of Lime.—How is it that in rickets, osteomalacia, and fractures of bones, that no great success follows the administration of phosphate of lime? Because the pulverised phosphate is used, of which the natural solvent is lactic acid. Owing to the small amount of lactic acid present in the gastric juice very little of the lime salt is dissolved, and nearly all passes off by the bowels. The proper preparation is a syrup, containing phosphate of lime completely dissolved by a sufficiency of lactic acid. The necessity of lacto-phosphate of lime to the organism is not at all understood. It is so necessary that the system languishes and wastes without it. Phosphate of lime is a constituent of all albuminoid substances, and is contained in equal abundance in seeds and all growing vegetable substances, whilst it is almost absent in the fully-formed wood. Why should a growing shoot contain this substance? A growing child requires it as much, and many cases of debility and wasting in children are curable by its administration, as it is a general stimulant to nutrition, improving the appetite and imparting vigour to the system. (M. Blache, Paris, Practitioner, Feb. 1872, p. 65.)

Post-Partum Hemorrhage.—*Injection of Perchloride of Iron into the Uterus.*—The strength of the solution used should be one in ten. The Americans prefer persulphate of iron. This may be used in the form of one part of the liq. ferri persulphatis of the British Pharmacopœia to six or eight of water. (Dr. R. Barnes, p. 340.)

Prolapsus Uteri.—The simple ring pessaries introduced by Dr. Graily Hewitt are by far the best ever brought into practice. This instrument is merely a copper wire ring coated with gutta percha, and of various diameters. It can be moulded into any shape, thus being suitable for all cases, whether anteversion, retroflexion, or prolapse. (Dr. C. R. Drysdale, p. 308.)

Treatment of Prolapsus Uteri without Mechanical Means.—Having replaced the uterus, with the aid of the speculum paint the fold of the vagina surrounding the os with tincture of iodine, diluted with an equal amount of alcohol. Let the patient remain in bed, and have an injection four times a day of pure spring water, of the temperature of 48°, or thereabouts. The painting is then to be repeated, followed by the douches. After this it is not generally necessary for the patient to remain in bed, but the treatment should be continued. (Dr. N. Andreef, p. 310.)

MISCELLANEA.

Anæsthetics.—One death in 2872 cases occurs from the use of chloroform, whereas only one in 23,204 occurs from the use of ether. (Dr. Coles, p. 354.)

Combination of Cloroform and Ether.—When these two agents are combined one never knows what one is about. It is, however, an excellent plan to begin with chloroform: and as soon as the pulse shows signs of failure to commence the administration of ether, and continue its use until the pulse is restored, or as long as the patient remains quiet enough for the peformance of the operation. By this plan it is probable that the cases of unavoidable deaths from cardaic failure resulting from chloroform might be averted. (Dr. T. Jones, p. 371.)

Ether.—Ether is given at the Middlesex Hospital mixed with air. Air is passed over ether heated to 70°. Inhalation in one case was continued an hour with no bad results of any kind. (Mr. G. E. Norton, p. 360.)

The vapour of ether is highly inflammable, it should therefore never be used in any case where actual cautery may have to be employed about the face. If this is not observed a disastrous accident will some day occur. (Mr. J. Hutchinson, p. 363.)

The ether used must be pure, and what is termed anhydrous, and it may either be administered by Dr. Morgan's apparatus, or by means of a napkin or sponge. If a sponge is used it should be a cone-shaped one, and should be placed over the mouth and nose before any ether is poured on it. An ounce or more of ether should then be poured on the summit of the sponge and the operator should then with both hands carefully exclude the admission of air from the sides. All that is further necessary is to encourage the patient to breathe freely, and to keep on adding ether without

stint, and if excitement occurs to hold the sponge firmly and increase the amount of ether. As a rule, throughout the administration the pulse keeps full and bounding, and the face is flushed. There is never any collapse, pallor, or any dangerous symptoms. It is however not probable that ether will take the place of chloroform, but will be used where the latter is inadmissible. By using it in conjunction with chloroform the danger of the latter is very much diminished. (Dr. C. B. Taylor, p. 352.)

A large conical hollow sponge covered with waterproof jaconette is the best inhaler. About one ounce should be placed in the sponge which is held tightly over the face. An ounce and two-thirds is required to produce anæsthesia in a child, two ounces and one-third in an adult. This forms an average of fifty cases, out of which vomiting occurred thirteen times. The advantages and disadvantages of ether and chloroform seem to be so nearly balanced that the question as to which should be used appears to be one of safety only. If experience should prove that ether really is the safer then it should be preferred, but if not, then chloroform is the best, as being both cheaper and easier to administer. (Mr. A. F. McGill, p. 358.)

Dr. Morgan's Ether Inhaler.—A very good form of apparatus for inhalation of ether is that of Dr. Morgan, of Dublin. It consists of a circular box, having a large central aperture in the upper flat surface. This aperture is rendered air-tight by a flexible membrane which rises and falls with the respiration of the patient. The ether is poured in through a small side aperture, and its vapour is breathed over and over again by the patient. There is a mouth piece with flexible tube. Great saving of ether is effected. (Dr. J. Morgan, British Medical Journal, Nov. 23, 1872.)

Nourse's Ether Inhaler.—This consists of simply a cone of cardboard, two or three inches in depth, made so as to cover the mouth and nose with comfort. A flat sponge is inserted into and covers the upper end of the cone. (p. 369.)

Chloroform Administration.—Mr. Clover states that, since adopting the plan of measuring the chloroform and air, so as to insure that there shall not be more than three minims and a half in each hundred inches of air, his experience of chloroform has been so favourable that he has never felt the need of another anæsthetic on the ground of safety. The tendency to produce cardiac syncope increases with the dose. Some surgeons think that it is only necessary to watch the respiration during anæsthesia from chloroform. This is a mistake. It

is the pulse which should be kept carefully under observation. (Mr. J. T. Clover, p. 369.)

Whenever chloroform is administered from a handkerchief or sponge it should be diluted with one or two parts, by measure, of spirit of wine or eau de cologne. The spirit lowers the elastic force of the vapour of chloroform, and diminishes the amount of vapour which is given off in a given time, thus lessening the danger. (Mr. B. W. Richardson, Dr. Snow, p. 366.)

Treatment of Chloroform Poisoning. — At once commence artificial respiration by Sylvester's method. Standing behind the patient, seize his arms just at the elbows and press them firmly against the sides of the thorax, and then slowly and gradually and firmly draw them directly above the patient's head. Each time this is done properly the noise of inspiration will be heard. It should be done very deliberately, and about fifteen times a minute—if more rapidly all ingress of air into the windpipe is prevented by closure of the vocal chords. This has been ascertained by direct experiment. The patient's heat must be maintained by blankets and a hot bottle, and the diaphragm must be brought into action by means of one pole of a battery applied over the phrenic nerve, and the other on the right side of the thorax on the sixth or seventh interspace. This is done in order to avoid the heart. The rheophores must be well moistened and pressed well down. These measures invariably succeed in producing respiration, and must not be relaxed for at least an hour and a half. (Dr. G. V. Poore, p. 373.)

Methylene Ether.—When absolute ether and pure bichloride of methylene are mixed in equal parts a rise of temperature occurs, and a new chemical compound is produced—probably a combination of the radical ethyl with methylene bichloride. This liquid is the same sp. gr. as water, and boils at 90° Fahr. It has a peculiar odour of its own, less pungent than that of chloroform. It is a very rapid anæsthetic. The sleep induced is gentle, and is very rarely attended with convulsive movement. Vomiting is very rare. It is probably equally safe with ether, over which it possesses many advantages. (Dr. B. W. Richardson, p. 349.)

Methylene ether is actually cheaper than chloroform. It is much superior to sulphuric ether, as it is pleasant to take, and a much less quantity is required. (Mr. L. Tait, p. 351.)

Death from Nitrous Oxide Gas.—The death which has occurred from the inhalation of nitrous oxide gas clearly proves that

the assertion, so constantly made, that nitrous oxide gas does not affect the heart, is without foundation, for the first symptom was rapidity of pulse with diminution of volume. The immediate cause of death, however, was paralysis of respiration. There was no obstruction of the air passages, but the patient was powerless to inspire. (Ed. of the Lancet, p. 377.)

Apomorphia as an Emetic.—Apomorphia is probably the best emetic known. It is administered by subcutaneous injection. It is more rapid in its action than any other emetic, and perfectly safe, inasmuch as a dose larger than necessary does not produce corresponding effects. In cases of poisoning in children, or in insane persons, and where there is coma or loss of consciousness, it will be at once seen how valuable an addition this drug is to our materia medica. (Riegel and Bœhm, Glasgow Medical Journal, May, p. 362.)

Hypodermic Injections.—Push the needle through the integument (which has been pinched up for that purpose on the arm or shoulder) to the extent of three-quarters of an inch, and then withdraw the point a short distance before injecting the solution. If air is drawn into the syringe in filling it, the instrument should be inverted, and the piston pushed in, till all the air is forced out. (Ed. of Canada Lancet, Medical Press and Circular, Dec. 11, p. 514.)

Iron.—In iron we have two kinds of value; its value in ordinary small doses and in mild forms, when it removes simple anæmia; and its value in large doses—doses such as half a drachm to a drachm of carbonate of iron, or twenty to thirty drops of the sesquichloride tincture—when it seems, apart from the presence of any definite anæmia, to have a special effect in modifying the morbid state of nerve tissue. (Dr. T. C. Allbutt, p. 40.)

Narceine as a Narcotic—While morphia and narceine produce sleep, narcotine and thebaine produce convulsions and cramps. Narceine is a most valuable drug. It is better adapted for the purpose of inducing sleep than morphia, and it is entirely free from all excitant action, and acts as a pure narcotic. It is best administered hypodermically on account of its high price. One-eighth to one quarter of a grain is the proper dose to inject. (M. Eulenburg, p. 387.)

Poisoning by Aconite.—In a case related by Mr. Dobie, of Keighley, the treatment pursued was the subcutaneous injection of twenty minims of tincture of digitalis, and the application of galvanism to the cardiac region. The patient appeared dying when this was commenced. In twenty

minutes he was able to swallow, and a mixture of ammonia, brandy, and a teaspoonful of tincture of digitalis was given. The patient recovered. The chief effect of the aconite was to depress the circulation, and digitalis with stimulants seems the natural antidote. (Mr. W. Dobie, British Medical Journal, Dec. 21, p. 682.)

Poisoning by Opium.—*Atropine as an Antidote.*—In cases of profound coma from opium poisoning half a grain of atropine injected produces its full effect in two hours. The pupils, however, begin to dilate slowly in from ten to twenty minutes, and after an hour or more the face becomes flushed, the respiration soft without stertor, and the pulse stronger. If the coma is less profound a quarter of a grain may suffice. (Dr. J. Johnston, Shanghai, p. 384.)

Quinine.—Quinine may be administered in doses of one grain as a simple tonic, or in doses of ten to thirty grains as an anodyne. (Dr. T. C. Allbutt, p. 40.)

Smoking.—*Absorption of Nicotine in.*—There can be no doubt but that nicotine is actually absorbed into the system from smoking tobacco, and particularly cigars. It is found that 4,500 grammes of tobacco smoke passed through water yield 30 grammes of nicotine. (Dr. C. R. Drysdale, p. 399.)

PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

Art. 1.—ON RELAPSING FEVER.

By the Editor of the Medical Press and Circular.

The outbreak of relapsing fever in London seems likely to prove more serious than was at first thought likely. It was natural in a season of unusually low mortality to hope that the appearance of this fever on the Registrar General's books was only for a single week, and due to causes that, if not understood, were at least not about to give rise to much further mortality. The fact has, however, proved otherwise. We have already heard of the dreaded disease in Nottingham, Manchester, and other parts, besides the area of the Metropolis in which it first appeared this time. The country is certainly threatened with another invasion of the disease, and it becomes Medical men to be on the alert. We are glad that the Medical Department of the Local Government Board is awake, and has already issued the following directions:—

1. Relapsing fever is in a very high degree communicable from sick to healthy. The greatest personal predisposition to the disease is given by states of poverty and privation: so much so that the disease is often known by the name of famine-fever. The more confined the atmosphere in which sick and healthy are together, the more certain is the disease to be communicated.

2. Relapsing fever is eminently a disease which cannot safely be treated in the houses of the poor; for in them, crowded and ill-ventilated as they generally are, and with inmates often insufficiently nourished, there must be every likelihood that the infection will spread. It is essential that under such circumstances the sick should at once be removed from amid the healthy. Ample hospital accommodation is therefore an indispensable condition for limiting the extension of the disease.

3. Where relapsing fever has attacked, and when all its acute symptoms are past, the sufferers remain for a while extremely weak, requiring that food and restoratives should be liberally supplied them; in default of which, the feebleness left by the disease may often be of indefinite duration. This is the more important, because, where relapsing fever becomes epidemic, typhus often accompanies or follows it; and persons whom the relapsing fever has weakened not unfrequently fall victims to typhus.

4. At present (as in all times when epidemic disease is prevalent or threatening) it is particularly important that powers conferred by the Nuisances Removal and other general Sanitary Acts should be well exercised by those in whom they are vested. Very detailed district-inspection is most necessary. Everything practicable should be done, especially in all the poorer parts of each district, to promote cleanliness of and about dwellings. The washing and lime whiting of uncleanly premises, especially of such as are densely occupied, should be pressed with all practicable dispatch. It is essential that overcrowding should, as far as possible, be prevented, and proper ventilation be enforced; and in these respects common lodging-houses, and houses which are sub-let in several small holdings, will require particular attention. Great vigilance must be used with a view to the discovery of the first cases of relapsing fever in such houses; and frequent inquiry should be made as to the sorts of illness prevailing among the poor. The attention of Authorities is invited to the powers conferred on them by various sections of the Sanitary Act of 1866, with reference to infectious disease; especially to the powers conferred for purposes of disinfection, and for the conveyance of sick persons, and for the separation of the sick from the healthy.

5. Relapsing fever, as described in Medical text-books, has the following characters. The patient becomes suddenly ill with shiverings, headache, heat of skin, prostration, and generally vomiting. To these symptoms are usually added more or less yellowness of skin, and severe general pains resembling those of rheumatism. After from five to seven days, the symptoms abruptly cease. For a week the patient feels well, and has his ordinary appetite, his natural temperature, and a pulse often even slower than in health. On or about the fourteenth day from the commencement of the original attack, relapse takes place, with a sudden paroxysm of fever similar to the first. The duration of the stage of relapse is commonly three days. Second, or even several, relapses sometimes occur; and as above stated, convalescence is usually protracted.—*Medical Press and Circular, Jan.* 15, 1873, *p.* 48.

2.—REMARKS ON THE ETIOLOGY OF ENTERIC FEVER, IN CONNEXION WITH ITS RELATION TO THE STRUMOUS DIATHESIS.

By Dr. Henry Kennedy, A.B., connected with Sir P. Dun's, and (lately) the Cork Street Hospital.

The causes which by many are thought to be paramount in causing our fevers are too many, and the very utmost that can be allowed them is that they predispose to the engendering of fever, but that they will not actually excite it.

Now, in considering these predisposing causes of fever, it has always seemed to me that too much consideration has been given to one side of the question. Air, earth, water, sewerage, atmospheric changes, food and famine, vegetable and animal organisms, and other causes, have all been elaborately written about in connexion with the subject. The seeds of disease, if I may so call them, have been deeply investigated; but the soil on which they were to fall and take root has been scarcely recognized or taken into account at all; and yet I have the strongest conviction that this part of my subject is deserving our closest attention, and of throwing much light on the etiology of fevers, and on none more than the type of fever known as enteric or typhoid. It is quite true that the state of our frames, at a time when what is known as the epidemic influence prevails, has been long recognized as modifying sickness, and in a very marked degree. But I wish to push the idea much farther, and to show that the very fever itself undergoes a change, and this owing solely to the constitution or frame in which the fever is lighted up. This, then, is the point I have in view in the following remarks; and, without further preface, I shall now proceed to consider it. In doing so it will be necessary to begin by making a few general remarks.

In the first place, it may be observed, that the very same causes do not lead to the same results as regards the effects on our frames. I may illustrate this by supposing the cases of four persons, each of whom gets a wound of a similar kind. What are the chances that these will terminate in a similar way? One or two may heal up kindly; another may slough; another may get erysipelas; and still another tetanus. Or a man, after a slight sprain, exhibits gout; or after a fall, and without any wound, gets the terrible disease, diffuse inflammation. It cannot be doubted that in each and all these cases it is the state of the constitution which determines the result; and that had there been no tendency to gout or erysipelas these affections would not have arisen. But further still, a man breaks the neck of the thigh-bone, and dies at the end of ten or twelve days of a fever not to be distinguished from

typhus; or he goes off in the same way after anthrax or carbuncle; or, indeed, after any surgical operation, no matter how trifling. No one here ever questions the fact that it is the constitution is at fault, and so leads to the fatal result.

Keeping these facts in view, let us see if there be any similar ones in our fevers; and as typhus is one with which we are all more or less familiar, I shall, in the first instance, take it. Now, no one who has seen two or more members of the same family, coming from the same room and afflicted with this disease, can fail to have observed the marked differences, I might almost say contrasts, which they present. This is not the place to enter into these differences, whether it be the spots, the symptoms, the complications, or the duration of the attack. Suffice it to say they exist. Yet we cannot for a moment suppose that these differences are due to anything but a difference in the constitution of the patient; and this it is which impresses itself on the whole character of the fever. But these differences show themselves in what may be called another aspect. For typhus differs in different years—a fact which my predecessors in the Cork Street Hospital noticed again and again; and indeed the remark may be made of other diseases, which vary much in character at different periods, no matter what some of our Edinburgh friends may have stated to the contrary, and particularly as regards pneumonia, which one might suppose from their writings was a stereotyped disease, from which there could be no deviation. Is it necessary to remind you that the great Sydenham observed and taught differently? Anyone, too, familiar with the history of our recent epidemics in this country, cannot fail to have observed the marked contrasts which they exhibited. Thus, the great epidemic fever of 1817-18 was very different in its characters from that of 1847-48, which latter some of us may recollect. But it is not merely different periods which exhibit different phases of the same disease. On the contrary, we have positive knowledge that typhus fever is, in London, a much more fatal disease than with us. My own impression, too, is the same as regards typhoid. At any rate, as regards typhus, the fact is known and admitted, and I believe it would hold true of other diseases; nor do I know that any more interesting paper could be written than one which would contrast the diseases of London and Dublin, for it seems to me there are some very marked differences between them. But I only make this as a passing remark; and coming nearer home, and in close connexion with my subject, I may remind you of the marked contrast in the rate of mortality which typhus presents, according as it attacks the poorer or the middle and higher classes. It is certainly more than double, if it be not three times, as fatal in

the one as the other. Explain this as we may, it may be assumed that it is not due to anything special in the contagion itself, for such an idea would only be adding to the difficulties in the matter which already exist. To my mind, it is much more rational to attribute this difference of mortality to mental or bodily causes, or both combined, rather than a difference of poison, which only adds another difficulty where there is already enough.

The conclusion, then, I would draw from the several points —I may indeed call them facts—to which your attention has been directed this evening is, that the state of our frames, when poisons strike them, has a most important influence on the symptoms, progress, and result of each particular disease; and that this view goes far in explaining many of the apparent anomalies which surround the subject.

It will now be seen, I trust, how what has been advanced can be brought to bear on the etiology of enteric fever. My hearers are aware that for many years past the cause of this type of fever has been considered as totally different from that which causes typhus. Many amongst ourselves hold it; in London it still keeps its ground; and my friend Dr. Murchison has even gone so far as to name enteric "Pythogenic fever," from the idea that dirt was the great leading cause of the affection. In this view I cannot, with all respect, concur. I believe dirt, in every form, to be a strong predisposing cause of fever, but that it will lead to typhus as well as typhoid. That the latter is the isolated affection, which many hold, I cannot for a moment suppose; and I rather think that some, if not a good many, now hold different views on this point from what they did some years since. I am not, however, about to enter here into the arguments which I think can be adduced in favour of the view that typhus and typhoid are the result of a common cause. This I have done on more than one occasion previously. But I cannot help alluding to one fact, which my friend Dr. Grimshaw has recently made out, viz., that typhus and typhoid will arise in the same room, and at the same time. Need I say how totally at variance this fact is with the statement of Sir W. Jenner. I may add, too, that every other point of specific difference between the two types of fever can, I believe, be as easily controverted as this one. I repeat, however, that the entering into such details would be quite out of place at present.

But if we assume for a moment that these two types of fever arise from one common cause, how, it will be asked, do I account for the different symptoms and progress of the two affections? How is it that they present such signs as enables us to distinguish them—the one from the other—in the great

majority of instances? The answer to this question is the main object for which I come before you this evening; and keeping in mind what has been already advanced, it will be understood that I believe it is owing to the state of the constitution that the differences between the two types of fever are to be chiefly explained; and further, that enteric or typhoid fever is essentially due to the presence in the patient of more or less of the strumous diathesis. That constitutions vary in this respect admits of no doubt. Some exhibit the diathesis in a very marked degree, and others in a very trivial way; and so it is with the type of fever with which I believe it to be more or less closely connected. This idea may to most appear very far-fetched; but it seems to me to be sustained by a number of facts, which I shall now proceed to notice briefly.

There are, I imagine, few who have not been struck with the general aspect of a patient labouring under enteric fever,—I do not mean from the effects of the fever, but the general conformation of the individual. In the great majority of instances they will be observed to be persons of a fine skin, and many of them of a high complexion. Their frame and hands are delicately formed, and it is by no means uncommon to find marks of one kind or other on their persons. Thus you may see them bleer-eyed, or with spots on the cornea; or, if they be children, on the head, or, what cannot well be overlooked, and what has frequently come under my own notice, you will see scars on the neck, the result of enlarged glands, and suppuration following. In keeping, too, with these appearances, which, to say the least of them, betoken delicacy, we must keep in mind the duration of this fever, which seldom ends before the twenty-fifth, and is often prolonged to the fortieth day. As regards relapses, too, it is singularly marked in its character, and in this respect is extremely like other affections which are avowedly strumous, such as strumous pneumonia or ophthalmia.

Of the symptoms to which enteric fever gives rise, there are two which call for notice here. The first is hemorrhage, which is so frequent in this affection, whether from the nose, chest, or bowels; and yet this is just what we might anticipate from the nature of the constitution with which we have to deal. For it has always seemed to me that a frame tainted with struma is one, above all others, likely to exhibit hemorrhage.

The second symptom of which I would speak is the affection of the lungs, which is such a frequent complication of enteric fever. This is not the place to enter into the details of this affection. Suffice it to say, it is one of a specific character; that it resists treatment in an infinitely greater degree than the analogous affection met in typhus; that it frequently puts on all the characters of phthisis, and in a certain per centage of

cases does run into that disease. I am not sure that I could adduce any single fact which would bear more strongly on the point I am now discussing than the one just stated, and I know it has been met by others; and one gentleman in England, in the course of last year put on record different cases where phthisis followed directly on enteric fever. Long since I myself have done the same, and I rather think Dr. Grimshaw can now give similar evidence. The number of cases too, where, short of the actual invasion of phthisis, the symptoms persist for an indefinite period, is very remarkable. On many occasions I have sent patients out of Hospital with the hope that the change would serve them. But this part of my subject may exhibit itself in another aspect, as the following case exemplifies:—

Case.—A young man, of nineteen years of age, applied to me before Christmas, 1871. Different members of his family had died of phthisis, and there was no difficulty in making out that he also suffered from the disease. Under treatment he rapidly improved; that is, the symptoms all lulled, and he gained flesh, and became able to follow his occupation. In this way matters went on till October last, when I was asked to see him, and found him in bed, suffering from enteric fever in a well marked form. He had no less than three crops of eruption. After a very prolonged attack he got somewhat better, but I am sorry to have to add that the chest symptoms became then much more marked, and the poor fellow fell into what might be called a galloping consumption, which, in January of this year, carried him off. In another case, too, of enteric fever, which I saw with Surgeon Rogers, of William-street, where there was severe hemorrhage from the bowels, I learned that two years before the patient had been threatened with phthisis, and had spit blood.

In opposition to all this again I may advert to the frequency of the bronchitis which complicates typhus; and yet I have not met a single instance where this was succeeded by phthisis. I do not say it does not occur, but only that I have not met it. On the contrary, I have seen two instances where I knew that phthisis existed. Both of these passed through a very severe attack of spotted typhus, yet in both the phthisis was left just as it had been before the fever.

In the last place I may advert to the great similarity which exists between the morbid states of the ilium and mesenteric glands, met with in phthisical patients, and the morbid state of parts, the result of enteric fever. To myself there seems no difference. If this be so, it will not seem strange that I consider them as the result of some common cause—at least until some more plausible explanation of the great similarity of the

two morbid states be given. This idea in itself alone would lead to the conclusion that enteric fever was, or might be, called strumous fever. But I do not pretend to assert that the point is as yet settled.

The view brought before the meeting this evening has not been taken up hurriedly. On the contrary, it is the result of many years' observation; and in papers published long since I have adverted again and again to the same idea. Whether it be true in its entirety, as has been first said, I will not take on me to assert. But it may, I think, be assumed as proved that the presence of the strumous constitution, no matter in how slight a degree, is capable of materially modifying the symptoms and process of the type of fever known as enteric, and that it should ever be looked for. If the view advanced be correct it is quite plain to my mind that our prognosis will receive a degree of exactness which it has never yet done, and and that our treatment will be essentially modified by our knowledge of the nature of the constitution with which we have to deal.—*Dublin Jour. of Med. Science, March* 1873, *p.* 257.

3.—ON THE PATHOLOGY OF SCARLATINA, AND THE RELATION BETWEEN ENTERIC AND SCARLET FEVERS.

By Dr. John Harley, late Physician to the London Fever Hospital, and Assistant Physician at St. Thomas's Hospital.

[The pathology of scarlatina is so neglected a subject that no connected account of it exists in medical literature. As will be seen from the sequel, however, it is a disease of the lymphatic system, attended with inflammatory action of this system of glands, including the spleen, mesenteric glands, tonsils, and the solitary and agminated glands of the intestines.]

If we take the pathological conditions into one general view it will appear that *febris lymphatica is the appropriate scientific definition of scarlatina;* that death is very likely to occur during the first week of the disease from the formation of fibrinous clots in the heart and great vessels; that the condition of the biliary function is such as to lead to an outbreak of diarrhœa; that mesenteritis, and enteritis sometimes general but usually confined to the solitary and agminated glands, exist from the third day and onwards during an attack of scarlet fever, both being at their acme during the height of the fever, *i.e.* from the third to the seventh day; that the enteritis is usually latent, but ready to declare its presence upon slight provocation; and that this inflammatory condition of the

mesenteric and intestinal glands may persist to the sixty-ninth day.

From this view *one general conclusion as to the connection of scarlet fever and enteric fever is inevitable, viz., that the pathological changes accompanying an attack of scarlatina include all those of the first stage of enteric fever, and are so far identical with them.* And it follows therefore that the transition from the former disease to the latter is nothing more than a natural pathological sequence, readily determined by any cause which may increase the intestinal irritation.

Having traced the relation which subsists between scarlatina and enteric fever to its extreme results, I will, with the view of giving more completeness to my account, narrate a few instances in which symptoms of the two diseases coexisted. And, as an appropriate introduction to these examples, I will briefly indicate the points where the outward symptoms of the two diseases meet and overlap one another. In the early stages of scarlatina and enteric fever the bowels are usually confined; in the latter stage of scarlatina they are occasionally loose, and the stools have the same character as those of enteric fever. Rose papules are not to be observed in many cases of enteric fever; and they may, if carefully sought for, be occasionally found in scarlatina. But such papulæ as usually occur in enteric fever—I mean the few, often indistinct rose spots which mark the pallid skin, and which we may properly regard as diagnostic of the disease—such papulæ, I say, can hardly, or not at all, be discovered amongst the rough and vivid rash of scarlatina. It is only, therefore, when the rose papules are very distinct and well developed that we can expect to distinguish them positively in scarlatina; yet this may be done in no inconsiderable number of cases. But if the scarlet rash be fading, as is usually the case when the papulæ appear, then they are sufficiently distinct; and if we should see the patient for the first time at this stage of the disease, and particularly if the bowels happen to be loose, we should conclude that he was suffering from enteric fever, and such would surely be the correct diagnosis; but we must not, on that account, ignore the fact that a few days before, the disease was well marked scarlatina. A large number of cases of enteric fever may thus be traced back to their origin in scarlatina; and it is as incorrect as it is unscientific to divide the train of outward symptoms which constitute the phases of one morbid condition into two sets indicative respectively of two specifically distinct diseases—so regarded. All such classification puts an artificial line of demarcation where no real limit exists, and, for a time at least, effectually bars the advance of truth.

Excepting perhaps the flushed cheek, the mark of persistent abdominal irritation, there is no feature of enteric fever, which may not be observed in many cases of scarlatina; and conversely, a large number of patients who come under our notice for the first time suffering from enteric fever, will present the pallid face, the excoriated nostrils, the large red lingual papillæ and tonsils, the moniliform glands, and, occasionally, the aural discharge of a declining attack of scarlatina.

Again, some albuminuria is a common associate of scarlatina, but it may occur at any period of an attack of enteric fever. The urine of one of my patients who died of frightful sloughing of Peyer's patches on the 20th day, was loaded with albumen for four successive days before her death; and at page 571, vol. 1, of Reynolds' System of Medicine, I have given the history of another case in which albuminuria and general anasarca immediately followed an attack of enteric fever.

The intercurrence and sequence of scarlet and enteric fevers has been noted by several authors, and attributed to accidental coincidence. I believe that I have adduced sufficient evidence to satisfy an unprejudiced mind that it is due to a most intimate pathological relationship; in a word, that the pathology of scarlatina is precisely that of the first stage of enteric fever. In my article on "Enteric Fever," in Reynolds' System of Medicine, I have already expressed my convictions on this matter, and so strong were they at the time that work was publishing that I find I have in the proof sheet applied the term "Abdominal Scarlatina" to the contagious variety of enteric fever. I abandoned the use of the term at that time because it seemed to me that the evidence which I had adduced to show the connection implied by it was insufficient to convince those whose opportunities for examining the question in detail are rare, and whose scholastic principles would be shocked by such confusion of two diseases so universally regarded as specifically distinct. Now, however, that I am enabled to lay before the Society the full and complete evidence continued in the foregoing observations I will submit this term "Abdominal Scarlatina" to the profession as the appropriate definition of a disease which every intelligent practitioner will sooner or later meet with. Nor will I allow the opportunity to slip me, but in the interests of truth, as opposed to dogmas worthy of the dark ages, will ask my fellow labourers to go one step further with me, and discarding those transcendental ideas of enteric fever which make of it a specific disease dependent on one particular poison, open their minds to receive what experience will then soon teach them—that enteric fever, and all its attendant phenomena, may occasion-

ally become a part of almost any other general inflammatory condition, specific or simple.—*Medico-Chirurgical Transactions, vol.* lv., 1872, *p.* 103.

4.—AN OUTBREAK OF ENTERIC FEVER AT THE VILLAGE OF NUNNEY, SOMERSETSHIRE.

[The following are the inferences deducible from the observed facts of this outbreak by Dr. BALLARD, who has made a report on the subject.]

"1, That the fever in Nunney was enteric; 2, that it was brought into the village from a distant place by an individual whose evacuations, and those also of others attacked in the same and in the adjoining house, found their way into the Nunney brook at the upper part of the village; 3, that the fever spread in the village in consequence of the villagers habitually drinking the water of the brook thus contaminated, which water was still further polluted with the sewage of the village itself, containing, if not the actual excrement of the sick, yet certainly matters washed out of their soiled linen, and also more or less of their liquid evacuations; 4, that at the time of my visit, actual excrement from cases of enteric fever was finding its way into the brook at a hamlet only half a mile above the village of Nunney.

"The explanation above given of the origin and spread of fever in Nunney is confirmed by the sudden reduction in the number of fresh cases of the fever on the expiration of the week ending October 5. The causes of pollution of the water of the brook pointed out in the course of this report were still operating, but on and after September 24, water from an unpolluted source was brought in carts into the village daily for the use of the inhabitants. It could scarcely have been expected that the brook-water should at once have fallen entirely into disuse, that none of it should have been used by anyone in the village. Such changes are never to be effected suddenly. The result observed was just such and such only as I looked for. From eight to thirteen fresh cases had been coming under observation weekly for a period of five weeks; but in the week following the twelfth day from the introduction of unpolluted water, the weekly number of fresh cases fell to five, and in the next week to one."—*Medical Times and Gazette, Jan.* 4, 1873, *p.* 19.

5.—CARBONATE OF AMMONIA IN SCARLET FEVER.

By G. J. S. CAMDEN, Esq., Rhyl.

The following treatment of scarlet fever has come down from master to pupil through four or five generations of medical

men,—to myself from a partner I joined in 1828—therefore extending over a period of nearly 150 years. I was nearly losing a patient, when my partner told me if I persisted in treating scarlet fever *secundum artem* I should lose many. He then told me what he had been taught by his master, and had used for thirty years with the greatest success. I adopted his system, and am fully satisfied with the results. Never give emetics or aperients, nor bleed, nor use leeches, nor do anything to lower the power of life, but give ammon. carb. on the very onslaught of the disease, the earlier the better, when it will cut the disease short. I use it as follows:—℞. Ammon. carb. gr. x. vel gr. xij., aquæ ʒ iv., ʒ vj., vel ʒ viij.—for 16 years and above. ℞. Ammon. carb. gr. viij. vel. gr. x., aquæ ʒ iv., ʒ vj., vel ʒ viij.—12 years to 16 years. ℞. Ammon. carb. gr. vj. vel gr. viij., aquæ ʒ iv., ʒ vj., vel ʒ viij.—6 years to 12 years. ℞. Ammon. carb. gr. iv. vel gr. ʒ vj., aquæ ʒ ij. vel ʒ iij.—4 years to 6 years. ℞. Ammon. carb. gr. ij. vel iv., aquæ ʒ j. vel ij.—2 years to 4 years. Unless distilled water be used it must be cold boiled rain-water filtered, the dose to be taken every two, four, or six hours, according to the severity of the throat symptoms; the quantity of water to be regulated on the same principle. The worse the throat the stronger the dose of ammonia, the smaller quantity of water, and to be given most frequently. The choking from the ammonia is instantly relieved by a small quantity of cold water, but if done without the better. If the power of life is at a low ebb, wine or a tea spoonful of brandy, and the same of water between each dose, and beware of aperients. I have waited five or six days. The foregoing prescriptions I sent to a lady in Ireland, who had seen the effect in eleven cases in her own house. In the original treatment in cases in which the tonsils had become gangrenous, the following was used as a gargle:—℞. Rad. pyrethri ℥iij., aquæ ℥xvj., decoque ad ℥x. et cola; adde syrup. rheados ℥ij. —M. Gargar. sæpe utend. My partner used it whilst with me but once; I never used it, though I had one extremely severe case with gangrenous throat, through the nurse's negligence. There were twenty-two patients in the house—a school—and none died. I only used the ammonia and the brandy. In each case the child recovered. I never used leeches but once—the child being delirious—and then put on only two, and as soon as they came off stopped the bleeding. In my severe case ascites supervened, which nothing relieved. After several months in dread of paracentesis the umbilicus ulcerated, the cavity emptied, the child recovered, and grew a fine young woman. One great essential is the room kept cool and well ventilated.

Some few of my medical brethren have followed the treat-

ment on my telling them, and were as much satisfied as myself; but most are incredulous. I never lost a dozen patients from scarlet fever in the course of twenty-five years, though I lost two in forty-eight hours in one house; but that was the abominable situation of it—the corner of a small wood into which the drainage from a large farm yard ran in close proximity.

About the year 1838 (I think) there was a letter in the *Lancet* in which the use of ammon. carb. in scarlet fever was mentioned as a new discovery by a German M.D. Since then two letters have appeared in the *Times* from Dr. C. Witt—one on December 1, 1858, the other I forget when. Of diphtheria I know nothing, but believe it to be only another phase of scarlet fever. Of the sequelæ you have less after the ammonia treatment, having seen but little; and, should anasarca supervene, it will readily yield, as I have of late years found (with alternate doses of quinine as a tonic), to liberal doses of potass. bicarb. (Howard's) with potass. nitrat. taken in a large quantity of water. The potass. nitrat. I use is to be obtained only at powder makers'. It has been melted by heat and kept so for two or three days, so that all water of crystallisation is driven off. I mention this as I have always used it, and fancy I should not get a similar effect from any other. The sudden retrocession of the eruption I never knew to be of consequence; but the most severe and frequently fatal cases are usually those in which the eruption does not appear, and these cases are more frequent than is supposed, and are not suspected till too late. To my eye there is such a peculiar appearance of the throat it cannot be mistaken.—*Medical Times and Gazette, Feb.* 1, 1873, *p.* 131.

6.—A MECHANICAL THEORY OF FEVER.

One more addition has just been made to the theories which already exist of the cause of fever—that is, of increased bodily temperature. The most generally accepted fever-doctrine is certainly that which refers the condition to an increased production of heat within the body; but at the same time it must not be forgotten that such eminent authorities as Traube and Senator, of Berlin, would explain the elevation of temperature by a diminished loss of the same. For example, according to Traube, by spasm of the minute arteries of the skin, and the prevention of the cooling effect of the external air. The new theory might be called an extension of the one last named, and has been introduced and supported by Professor Hüter (*Centralblatt*, No. 5, February 1, 1873). According to this pathologist there may be an increased production of heat in

fever, but there is a great diminution of the loss of heat, and that from an interference with the passage of the blood through the lungs. In support of this theory Hüter adduces the following ascertained facts:—The lungs of a frog may be examined microscopically in the living animal, and under these conditions the rapidity of the circulation through the pulmonary capillaries is so great that the individual corpuscles cannot be seen. If a septic or pyrogenic fluid be now injected into the blood of the animal the rapidity is remarkably diminished over large tracts of the pulmonary surface, although the circulation is never completely arrested. In the remaining portions of the lung the circulation is carried on at its normal rate—that is, the circulatory disturbances in the affected parts of the pulmonary tissue are not due to a diminution of the cardiac force or activity. What the cause of the slowing is, is difficult to say; but, according to Hüter, it is to be found in the adhesion to the vessel-walls of the colourless blood-corpuscles, and to the action of the septic organisms and the mechanical disturbances they induce. The correctness of these observations being allowed, and the fact being remembered that the blood is cooled at the pulmonary surface just as at the surface of the skin, it follows that the smaller the quantity of blood which passes through the lungs, the less heat does the body part with—or, in other words, the higher does the bodily temperature rise. Hüter believes that as he has observed under those circumstances half the superficial vascular surface cut off from the normally rapid circulation in the frog, only about half the normal amount of heat would be parted with—a condition which would amply account for elevation of temperature in a warm-blooded animal. The obstruction in the vessels may be one cause at least of the increased cardiac frequency in fever; and the circulatory derangements would also explain in part the parenchymatous swelling of the liver, spleen, kidney, &c., under the same condition. Altogether, Hüter contends that there is not a single true fever-symptom which does not become readily intelligible on this new theory of pyrexia.—*Medical Times and Gazette, March* 15, 1873, *p.* 278.

7.—TRANSFUSION OF MILK IN CHOLERA.

By Dr. Edward M. Hodder, Toronto, Canada.

Previously to the last advent of cholera, twelve or fourteen years ago, I suggested to my friend and colleague, Dr. James Bovell, the propriety and probable success of transfusion of blood. He at once met me with the objection, that the supply would most likely fail, inasmuch as few persons would like to

part with their blood during an epidemic of the kind, and if they did we could not be sure that the blood itself was not diseased. This appeared to knock my scheme on the head at once, but I began to reflect, and to ask myself, What is the nearest analogue of the blood? and milk came to my mind. The next question to be decided was, whether milk had ever been injected into the veins of man or animals, and what was the result? I found that Donné had injected it into the veins of dogs, rabbits, and birds, and that it did not kill them, but, on the contrary, he, with Wagner, Gulliver, and others, were of opinion that the white corpuscles of the milk were capable of being transformed into red blood-corpuscles.

I then decided on the transfusion of milk into the human veins, should cholera pay us another visit.

At length the true Asiatic disease made its appearance, and found the City Fathers as unprepared for it as if such a disease had never existed. Dr. Bovell and myself volunteered our services, and an old shed on the hospital grounds (used as a small-pox ward) was made the temporary cholera hospital. The first two or three cases were moribund when brought in; but the next day, about noon (the hour at which the medical officers of the hospital made their rounds), a stout-built farmer, who had come to Toronto on business, was admitted. He was in a state of collapse, cold, pulseless, blue, and shrivelled; the secretion of the urine was arrested; there were vomiting and purging of rice-water fluid;—in fact, he seemed dying.

I immediately got everything ready, and then sent a messuage requesting consultation with any of the medical officers who might be in the hospital, when four gentlemen came, and I asked them the following questions:—"Do you consider this a genuine case of epidemic Asiatic cholera?"—"Certainly, and a very marked one." "Do you think anything can be done to save him?"—"Nothing; he is dying." "Would any medical treatment be likely to be of any use?"—"None." "Then he must die."—"Yes." "Then, gentlemen," I said, "I am about to try the experiment of transfusing milk into his veins." —"If you do you will kill him," was the reply. Thereupon I invited them to be present at the operation, but three out of the four left the building; the fourth remained but would not assist. Everything being ready, I ordered a cow to be driven up to the shed; and, while she was being milked into a bowl (the temperature of which was raised to about 100° Fahr.) through gauze, I opened a vein in the arm and inserted a tube, and then filled my syringe (also previously warmed) and injected slowly therewith. No perceptible change, either for better or for worse, took place; so, after waiting two or three

minutes, I again filled the syringe, and injected seven ounces more. The effect was magical: in a few moments the patient expressed himself as feeling better; the vomiting and purging ceased, the pulse returned at the wrist, the surface of the body became warm;—in fact the man rallied, and speedily recovered without a bad symptom.

The next day a woman, an habitual drunkard, was admitted in the same condition as the above described man. I transfused fourteen ounces of milk in a similar manner, and in a few minutes the vomiting and other symptoms ceased, and she improved; but towards evening collapse came on, when I injected fourteen ounces more milk, and she also recovered, but after secondary fever.

The third case was admitted almost *in articulo mortis*, but he rallied for a time, then collapsed, as the woman did, and died during my absence from the shed. Had I been present I should have injected more milk into his circulation, and he might have rallied again.

Dr. Bovell and myself then applied to the Corporation for a good cow, and a few articles indispensably necessary for the comfort and well-being of the patients; these were refused, and we thereupon sent in our resignations.

[It is to be regretted that this most interesting experiment came to such an untimely end, and we join in the wish with which Dr. Hodder concludes his letter, that it may be repeated here on a large scale should cholera ever visit England again. We scarcely know whether it is necessary to add, even for the information of English readers, that Dr. Hodder is a very distinguished and experienced practitioner, so that his evidence is most valuable and trustworthy. We would suggest, however, that it would probably not be necessary to take the milk direct from the cow; artificial warming would surely answer the purpose? Ed. *Pract.*]—*Practitioner, Jan.* 1873, *p.* 14.

8.—ON THE RELATION OF GOUT TO URIC ACID.

By Dr. W. M. Ord, Assistant Physician, St. Thomas's Hospital.

In this country no one exerts probably so much influence upon the current ideas of gout as Dr. Garrod. No one has a better right to exert strong influence than the accomplished physician and chemist who detected the excess of uric acid existing as urate of soda in the blood, and has since by patient and conscientious observation put this and similar discoveries beyond the reach of doubt. The latest exposition of Dr. Garrod's views is presumably to be found in his article on gout in the first volume of the "System of Medicine" edited

by Dr. Russell Reynolds (1870). At page 883 *et seq.* three propositions are offered:—

"1st. That it is essential to the production of this form of articular inflammation that the blood should contain an abnormal amount of uric acid, or rather of urate of soda; and even the phenomena which constitute irregular gout, or are regarded as gouty manifestations, demand for their manifestation the presence of the same salt in the circulating fluid.

"2nd. That gouty inflammation is invariably accompanied with the presence of urate of soda in the inflamed tissue.

"3rd. It can be shown that the amount of deposited urate is not in proportion to the intensity of the inflammation, and that in some structures the infiltration may ensue and scarcely give rise to any inflammatory action; facts tending to the supposition that the deposited matter may be looked upon as the cause rather than the effect of such inflammation."

In an earlier paper Dr. Garrod had spoken of the excess of urate of soda in the blood, and the deposit in the joints as pathognomonic of gout, in such a way that gout might thereby be decisively defined from rheumatism. The propositions, therefore, declare an advance in speculation. The urate of soda rises from a sign to be a *materies morbi*, and the deposit of urate in the cartilages and ligamentous structures of joints comes to indicate that these tissues are selected as agents in freeing the blood of the excess; certain joints being usually the first affected, and afterwards, "the blood still remaining impure from the presence of the salt, other surfaces" requiring to be "selected." As nearly then as possible gout here returns to its derivative meaning of a dropping (gutta) of morbid matter into joints. The excess of the urate is held to be explained partly by defective excretory power (the kidneys being in fault), partly by undue formation of uric acid in the system.

There is so much attraction for men's minds in the neatness of a compact hypothesis that this idea of the proximate cause of gout is apt to be carried away by a reader of Dr. Garrod's article with far less qualification than the author would probably desire. Indeed, he is careful to guard against the routine practice which would naturally follow upon the simple acceptance of the idea by pointing out that "each individual case not only exhibits its own peculiarities and becomes a separate study, but likewise demands in certain respects a separate treatment."

But even when this qualification is properly recognised, the conception of the cause of gout suggested in the above propositions is insufficient. It is still of first importance to regard gout as a mode of decay; to regard a gouty man as a man whose

journey to the grave leads through definite regions of textural degeneration. The excess and deposit of uric acid are notable accidents of the way; are possibly efficient causes of much of what is most characteristic in the journey. But in errors of the entire process of nutrition—of primary concoction of the body, of concoction of introduced matters subservient to nutrition, of concoction of matters that have subserved nutrition and are to be removed—must be sought the explanation of that loosening and poisoning of the system to which, as I would urge, gout may be reduced.

Taking it to be a fact that uric acid is deposited in combination with soda within the joints of the gouty system, does this in the first place necessarily mean that the acid is poured out in order to free the blood of its presence? The sum of evidence seems to me against the necessity. Uric acid is universally allowed to be a product of the disintegration of the tissues or of the food; it is a substance of little solubility as compared, for instance, with the allied substance urea; and for this reason among others is not removable in large quantity from the blood by the kidneys; for the same reason, if formed within the tissues, it will not be removable in large quantity by the blood. Now, when we find a halo of fat round the margin of the cornea, a tissue nearly allied to joint-cartilage, we do not infer that the blood is too full of fat and that the cornea has been selected as an organ of elimination. All the language used respecting arcus senilis is on the contrary fitted to an idea of degeneration of the cornea having for one result the deposit within the corneal tissue of the comparatively insoluble matter, fat. When, again, we find crystals of cholesterine in an old sebaceous cyst or in an advanced atheroma, we similarly have suggested to us ideas of local degeneration and of immobility of the resulting substance. In the same way the presence of urate of soda in parts of the body remote from the centre of the circulation, in tissues of little vascularity and low activity, may be taken to be a mark of a certain kind of degeneration or want of organisation of those tissues, or of the juice thrown out from the blood for their use. Moreover the symptoms of general disorder which gouty patients exhibit may be taken to be a mark of a corresponding process of degeneration or want of organisation affecting other organs and tissues under conditions which less readily permit the deposit or less hinder the removal of the urate.

I have been speaking chiefly of first attacks. But the daily experience of gouty cases goes to connect every fresh attack with distinct exciting causes. A long walk, a wrench of a joint, a fall, violent nervous excitement or anxiety, an attack of indigestion, are so many examples of constantly recognised

agencies. These have at least one condition in common—a disturbance of the circulation in some part of the body. The temporary congestions of the healthy man are represented by the characteristic inflammation in the gouty man. I may take here as an illustration the case of a gentleman who was for some years under my observation. By a superb disregard of all ordinary care in living he had engrafted gout upon a constitution of far more than ordinary natural vigour. When I first saw him the feet and hands were already much distorted by gouty deposit, but the attacks of gouty inflammation chiefly affected the abdominal viscera—the intestines in particular. His mind was possessed with the idea that free purging was the true and only remedy for gout; and this remedy used for years had brought him to such habit of constipation that nothing short of croton oil in large doses could now procure relief. After finding himself more than once at death's door through abdominal inflammations he consented to be treated with more gentleness; and at length, by the use of dilute saline solutions and enemata, the bowels were induced to act regularly and easily. Thereupon the abdominal attacks ceased, and his health improved. So long as he remained quiet his joints remained free from inflammation, but occasionally a long walk would be followed by gouty inflammation in the feet and knees. He died at last of severe gouty inflammation. Hurrying along one day in the city he tripped over a brewer's rope and fell full length upon the pavement. The shock was severe, but he speedily rallied, and was to all appearance quite recovered by the evening. But the next day he had gouty inflammation in nearly every joint of his body and in the membranes of the spinal cord. Under this combination he soon sank. His kidneys gave at no time any indications of congestion or impairment of function, and throughout my observation of him his attacks of gouty inflammation were always capable of explanation by local causes of excitement. And this I maintain is a constant experience in gouty cases. On the other hand, it is necessary to admit that uric acid is something more than a sign of gout, and is capable of irritating and causing inflammation of tissues. Like other chemical products of waste it seems when present in too large proportion to hinder the functions and impair the nutrition of the tissues. And any cause which tends to pour an excess of urate of soda suddenly into the blood may thereby cause inflammation of parts already obstructed and of lowered vitality. The extension of gouty inflammation from joint to joint may be, in part, effected by the poisoning of the blood consequent on the rapid decomposition of the part first affected. I have certainly seen gouty inflammation set up in distant parts under

circumstances which permitted the entrance of urate of soda into the blood from a part not at the time inflamed. A gentleman, aged now about 44, a sufferer from gout since his seventeenth year, has large chalkstones in the heels of both feet. These concretions have given rise to suppuration, but are so entangled with the living tissues that they cannot be removed; they remain therefore in the centre of large angry and painful granulations, and are a source of great distress. On three occasions I have applied solution of iodide of potassium to these with the double object of promoting their solution and of freeing them from the textural web. On all these occasions relief of local irritation has been followed by the establishment of gouty inflammation in distant parts. My own observations, indeed, accord with the facts upon which Dr. Garrod founds the statement that "the inflammation of the gouty paroxysm tends to the destruction of the urate of soda in the blood of the inflamed part." But it would be a necessary consequence of the greater flow of the blood through the affected part that much urate and probably much allied stuff should be at first swept into the circulation, even if afterwards, when the inflammatory process should have been established and the temperature of the part and of the body raised, much urate in the part and elsewhere should be burnt up. It is (I may remark) certainly the case that in violent gouty inflammation a sudden local formation of urate may take place. A gentleman already too familiar with the course of gout having been attacked one night with a pain in the ankle altogether exceeding all his former experience, applied on lint with a covering of oiled silk a mixture of equal parts of the liniments of belladonna and chloroform. When I saw him, two days after, the ankle was enormously swollen; there was extensive fluctuation over and below both malleoli; and a crown-piece area of skin was on each side discoloured and insensible. The skin giving way on both sides, a large quantity of thick dark fluid containing much decomposed blood, a little pus, and large quantities of small acicular crystals of urate of soda was set free. There must have been at least fifty or sixty grains of the salt in about three ounces of the fluid which were caught on lint. The large formation of uric acid must here have taken place in the part, and was in evident relation with the severity of the inflammation. There was no such mitigation of the severity of inflammation in other joints as might have suggested that the uric acid was seeking an outlet at the ankle. They were indeed rather worse treated than was usual, and there was no notable, if any, subsequent relief of gouty symptoms. In illustration of the peculiar nature of gouty inflammation it is worthy of note that, even though the ankle had been as it were per-

forated, complete healing followed on both sides of the joint; and that the patient, a man of eighteen stone, was able to walk within three months, with the aid of sticks.

The extension of gouty inflammation, however, does not require the interference of uric acid for its explanation. As it is certain that in many cases simple inflammation is propagated from part to part by nerve influence, it is not illogical to assume that this may occur in gout. I have seen in several instances local inflammation like those of rheumatoid arthritis originate in local causes, and spread in a way that was more attributable to nerve influence than any other cause which I could imagine. One case in particular I was enabled to follow throughout its history. A lady, who had reached the age of 82, without failing in her intellect, senses, or muscular powers, and who lived an easy, well-regulated life, struck one day the metacarpo-phalangeal joint of the forefinger of the left hand a very sharp blow with a key. A pain as sharp as the blow followed, and the next day the knuckle was swollen and tender. The swelling became hard, the tenderness continued and the pain extended up the arm, in spite of all kinds of local applications, including subcutaneous injections of morphia. The part had all the appearance of being affected with rheumatoid arthritis. At the end of a month the first joint of the thumb became similarly affected, and, later on, the wrist. At the same time as the wrist the first joint of the index finger of the other arm swelled up in the same way. Both hands eventually became almost useless. When a year had passed the hips and knees were swollen and fixed, making the poor lady a prisoner to her room. Finally, a slow invasion of congestion occurred in the lungs, and led to her death about eighteen months after the receipt of the injury. The case has been always for me typical as showing how, even if the several parts of the system be ripe for dissolution, the evil day is held off as long as no sufficient local excitement occur to fire the train. And the local cause here was one of much severity as regarded pain. There was so much suffering of a neuralgic kind in the knuckle first struck as to create a strong impression that some nervous structure, a twig or some large touch-corpuscle for instance, had been crushed; and in reviewing the case I have often thought that section of nerve, or the long-continued use of constant galvanic currents along the course of the nerve, might have kept the mischief from spreading. For the history leaves no doubt in my mind but that reflex nerve influence was the agency by which the local ailment became ultimately a general and mortal disease.

There remains one consideration of much importance in the more or less pronounced improvement of the general health

which follows a fit of the gout. If it is true that the hopefulness of human minds has much exaggerated the extent of this improvement, its occurrence is nevertheless to be observed in many early attacks of gout. Dr. Garrod offers evidence that during the gouty inflammation "the blood loses to a great extent, if not entirely, the morbid condition which previously existed, and hence the disappearance of the malaise." It is already noted as probable that during the inflammation much morbid matter is burnt up. Where uric acid accumulates two important conditions commonly obtain—deficiency of arterial and stagnation of venous blood; and the parts where the accumulation is most common are parts that are much cooler than the rest of the body. Access of oxygen and rise of temperature may be readily conceived to favour the combustion of uric acid and similar matters. In the gouty system the various organs will always be to some extent charged with the products of their once incomplete or hasty decomposition. Now, it is a well-established doctrine in physiology that tissues are poisoned by the accumulated results of their own waste. If extractive of muscle be injected into the vessels of a muscle the subsequent application of ordinary stimuli will fail to produce any active contraction. But the muscle is only poisoned, not killed, and, if the vessels are well cleared out with water, will resume its power of active contractility. The feeble muscular power of cyanosis and the incapacity of continued exertion in the subjects of acute rheumatism belong to the same list. If in gouty inflammation a quantity of urate that has been poisoning certain tissues be removed, it is conceivable that those tissues shall give better signs of health afterwards. Moreover, in a few cases the gouty condition having been produced by temporary influences, the tissues may have sufficient vigour to nourish themselves better than before the attack, being freed from the obstructive matters. For, other things being equal, the nutrition of a tissue is active in proportion as the extractive is readily removed. Animals, for instance, fatten best and most healthily when freely supplied with water. It can be understood, therefore, how in a limited number of cases abatement of many local distresses, and even some improvement in health, may follow a sharp attack of gouty inflammation in a part.

But recurring inflammations proceed inexorably to damage the quality of all the tissues, and diminish their power of recovery even if freed from their incumbrance; and it is more than doubtful if the felicitations usually addressed to a man who, having been out of sorts, has a good fit of the gout, have any merit of appropriateness, excepting where gouty inflammation has been transferred from internal organs to an extremity. To avert local attacks and to hinder the extension of inflammation

must be the aim of intelligent practice. In the accomplishment of the first object the old rules of regimen will still hold good. In the way of remedies eliminant medicines, among which pure water should hold a high rank, must be regarded as of high value; and to their use must be added the adoption of all possible measures to promote the concoction of healthy tissue, such as the use of cod-liver oil, of milk and fatty foods, and of good meats in moderate quantity, and the administration of tonics of various kinds, such as iron, arsenic, and the vegetable bitters. We must do all we can to wash away the offending extractive, and we must not neglect to make our process of repair and refitting as perfect as possible.

The foregoing remarks upon gout may be summed up as follows:—

1. Gout is a mode of decay of the whole system, marked by the deposit of urate of soda in and about joints, and by local inflammation of a particular kind.

2. The deposit of the urate is a result of local or general disintegration, and is not to be regarded as a means of eliminating urate from the blood.

3. The local inflammations do not necessarily depend upon the deposit of urate, and the deposit is not a consequence of inflammation; at the same time it is probable that excess of urate in the blood produces irritation of tissues.

4. The local inflammation is peculiar in respect of the ease with which it is produced, of the pain by which it is attended, and of the products, which are chemical rather than structural; chemical substance of low molecule, tending to crystallize or to be dissolved, being formed in the part, instead of substances of high molecule tending to be organized. Interstitial subcrystalline deposit is common, suppuration rare, in gout.

5. The local inflammations are set going by local exciting causes.

6. The local degenerations and inflammations tend to infect the rest of the system through the blood, and to set up similar actions elsewhere through reflex nervous action.—*St. Thomas's Hospital Reports*, 1872, *p.* 228.

9.—ON THE TREATMENT OF LUMBAGO AND RHEUMATISM WITH ACTÆA.

By Dr. J. J. H. Bartlett, Surgeon to the Kensington Dispensary.

Actæa has for some time been known as a useful drug in the treatment of the different varieties of rheumatism; and the following observations were made in order to discover if there

was any one symptom or chain of symptoms which indicated its use, as to whether the pain was made worse by heat or cold, increased by rest or motion, or felt most in the day or in the night.

The observations were made on twenty-nine cases of subacute chronic rheumatism and lumbago, and I regret to note that I have not found any one symptom or combination of symptoms which pointed out the unfailing utility of the drug, but at the same time the effects of the actæa on the above-mentioned diseases were very great.

The average age of the patients treated was 39 years 3 months.

Out of the twenty-nine cases, fourteen were suffering from lumbago, of whom eleven were cured; and fifteen were suffering from chronic and subacute rheumatism, of whom eleven also were cured.

In the twenty-two cases which were cured the pain was worse at night in 13; in the day in 9; when cold in 6; when hot in 11; when resting in 2; on movement in 20.

In the seven cases which received no relief, the pain was worse at night in 3; in the day in 4; when cold in 2; when hot in 4; when resting in 0; on movement in 7.

The action of the actæa in some of the most chronic cases was very marked; it appeared indeed to give relief at once.

The following are fair examples of its utility:—

Case.—May 27, 1872. S.W., a female, aged 40, was admitted a patient at the Kensington Dispensary. She has had pains in the loins for six months, which are worse in the day and on exercise; heat and cold make no difference. She cannot stoop or rise from her chair without great pain. Catamenia regular. Urine at times very highly coloured. Pulse, 96, regular. ℞. Tinct. actææ ʒ ss, aquæ ℥j, ft. haust. ter die sumend.

May 30. Pain is much better than it has been for months; she can now stoop with ease. She suffers from some headache after the actæa. Pulse, 84, regular.

June 6. Pain quite gone, but suffers a little from backache at times.

June 10. Quite well.

Case.—June 20. S. R., male, aged 60, was admitted a patient at the Kensington Dispensary, suffering from pain in the left lumbar region, which was of some weeks' duration: it made its appearance after an accident. The pain was worse at night when hot and on movement. Pulse, 76, regular. ℞. Tinct. actææ ʒ ss. aquæ ℥j. ft. haust ter die. sumend.

June 24. The pain has shifted from the left loin to the left hip. Pulse, 88, regular.

June 30. Quite well: feels better than he has done for months.

The actæa was administered in the form of the tincture, the dose being ʒ ss. three times a day, except in the case of two children, T. W. and J. P in which the dose was ♏ x and ♏ xx, respectively increased to ♏ xx and ♏ xxx. In four cases the dose was increased to ʒ j, but only one of these cases was relieved.

Unpleasant symptoms caused by the drug were noticed in six cases. They were, giddiness, headache, nausea, vomiting, and irregular pulse; these at once ceased on discontinuing the drug.

Diminution of the pulse has been mentioned as one of the effects of actæa, but I have not noticed this to be the case.

It is very important to use a freshly prepared tincture, as old preparations lose much of their efficacy.

I have also treated several cases of gout with actæa, but I have not found it of any benefit in these cases.—*Practitioner*, *March* 1873, *p.* 135.

10.—BLOOD-POISONING IN MAN AND ANIMALS.

By Nathaniel Alcock, Esq., Assistant-Surgeon 35th Regiment.

A farmer in the south-eastern part of Ireland had lost three cows from a sudden and inexplicable illness which terminated fatally in from twenty-four to forty-eight hours. No cattle-plague existed in the vicinity, nor had he added any strange animals lately to his stock. A fourth cow, which presented no signs of the disease on Friday evening, was attacked in the night, and died on the day following. A veterinary surgeon was summoned, and the farmer, a young, healthy, and most intelligent man, opened the carcase for inspection. In so doing he wounded his right thumb slightly against a spiculum of bone, but proceeded with the dissection regardless of the scratch. No clue to the nature of the disease was found, except an enlarged and engorged condition of the spleen. All other organs were apparently healthy, and the veterinary surgeon thereupon pronounced the cause of death to be "splenic apoplexy." Among the lookers on at the examination of the cow were a sow, a terrier, and a greyhound, and when the spleen, which was fixed on as the offending organ, was cut up for minute investigation, they devoured the pieces that were thrown aside. On the following evening, about four o'clock p.m., the sow was found dead, and later on in the night the terrier also. On the next day (Monday) the farmer felt some pricking in the scratch, and was a little "out of sorts." On Tuesday he found himself "sickening," and had pain in the thumb, but still thought it would wear away. On Wednesday, however, he was in a

high state of fever, and his arm had swollen considerably to even above the elbow.

He now sent for a doctor, who, recognising the extreme gravity of the case, suggested a consultation, and I have been put in possession of the medical particulars by the surgeon who was then called in, and who subsequently brought me into personal communication with the patient. The swelling of the arm was very great, the axillary glands were much inflamed, and around the wound a vesicle of reddish serum had formed. Two similar vesicles had risen on the left arm, and a third on on the chest. The distress of the patient was extreme, his pulse was very quick and weak, and he was evidently being rapidly poisoned. Believing that all treatment would be unavailing, it was agreed by the surgeons to try the effect of large and frequent doses of quinine. Accordingly, after the application of a poultice to the inflamed arm, quinine gr. v., with acid. hydrochlor. dil. ℥x., was ordered to be given every third hour.

On the afternoon of the following day they revisited the patient, and were inconceivably astonished to find him sitting up in bed, no longer anxious, but now assured of his certain recovery; the fever and all other concomitants of blood-poisoning, were rapidly subsiding, and the local symptoms disappearing in proportion. The interval between the doses of quinine were doubled, and the medicine continued.

On the ensuing Sunday, the fourth day of the treatment, he was up, and was soon after at his usual occupation.

The greyhound, the only survivor of the three animals that had eaten of the spleen, was found on enquiry to have been extremely ill, though but little cared for during the danger of its master; and, on being looked at, large dark spots like dried up bullæ were seen on the flanks and belly. It ultimately recovered. The disease continued still among the cattle, destroying in all ten cows and two calves.

Here, then, is an instance of a poison, communicable by infection from beast to beast, being transferred by inoculation to the human system, producing there the most violent symptoms of blood-poisoning, and yet being suddenly and unexpectedly neutralised by the introduction into the same system of quinine.

Dr. H. Thompson, Surgeon to the Tyrone County Infirmary, details in the Dublin Quarterly Journal the case of a medical man who in the discharge of his duties contracted typhus fever, which passed into the most severe maculated form with complete nervous prostration. On the eighth day his condition was considered by his professional brethren to be perfectly hopeless, as he was sinking despite the free use of stimulants

and nutriment. In the early morning of the ninth day, quinine in three-grain doses was resorted to, at Dr. Thompson's suggestion, as an experimental measure. In consequence of some alarming excitement being produced, the attendant omitted the medicine after the second dose. On the morning of the next day it was resumed in five-grain doses every three hours. On the day following (the eleventh) decided improvement had taken place, and on the thirteenth he was out of danger. Dr. Thompson writes—"The resolution of the fever may be said to have been complete on the second day of the exhibition of the quinine, and on the thirteenth day of the disease, the change having commenced on the eleventh, which is not one of those periods commonly regarded as critical *in the natural course of the disease.*"

Thus in two distinct varieties of blood-poison quinine appears to have successfully antagonised the destroying virus; but whether it acts directly by catalysis, or throws a protecting shield over the vital elements at the expense of which the morbid matter carries on its enormous self-multiplication, remains for further research.—*Medical Times and Gazette, Jan.* 18, 1873, *p.* 60.

11.—ON LEAD POISONING.

By Dr. Francis E. Anstie, Lecturer on Medicine at Westminster Hospital School, &c.

[There is generally a period in which the patient simply feels unwell, without any more marked symptoms than foul breath, muscular languor, and occasional griping pains in the abdomen.]

Upon this there suddenly supervenes intense abdominal twisting pain, chiefly round the navel, perhaps vomiting, and complete obstruction of the bowels in most cases, though occasionally a partial action of the bowels continues. There is usually severe prostration, the pulse is small and tense, but generally not quick; often the pain causes cold perspiration to stand on the face.

When you are called to a patient in such circumstances you would inquire about his history. Even if you did not know that he had been exposed to lead poison, and even if he had not followed any trade directly predisposing to plumbism, you should still look further, because the metal might have entered his system in some less recognisable way. Especially you should examine his gums: lead poisoning nearly always shows itself by a bluish-purple line next the teeth and encroaching on them; it ceases where there is a gap from a tooth being

absent. This sign, when present, is conclusive of the existence of metallic poisoning; and, under the circumstances, lead is much the most probable agent.

In dealing with this condition your first object is to allay the intestinal spasm, without which relief the peristaltic action of the bowel cannot be restored. For this purpose the best remedy you can administer is a draught containing half a drachm of ether and the same quantity of Battley's sedative solution with camphor mixture; this should be followed up by a large warm water enema. The draught may be repeated in an hour's time if necessary, and the enema should be repeated in two or three hours' time if the bowels have not been relieved; it should be thrown high up into the large bowel with a long elastic tube. Continuous hot fomentations should also be applied to the abdomen. By these means you will seldom fail to relieve the spasm and obtain evacuations. But if this does not occur in a few hours it is best to change the plan: you should now administer one-thirtieth of a grain of atropine hypodermically every three hours (for there is often vomiting in these protracted cases), and the constant current should be applied, about forty cells being used, the positive pole being placed on the navel and the negative inserted into the rectum. In this way you will pretty certainly relieve the spasm and obtain action of the bowels.

As soon as the attack of colic is over you must at once direct your attention to the removal of the poison; for lead is one of the few poisons the elimination of which we can directly assist by medicine. Iodide of potassium, in doses of ten increased to twenty grains, three times a day, effects a real elimination of lead by the channel of the urine. It is unnecessary to say anything about the precautions against continued introduction of lead into the system, since these will have been explained in the lecture on Toxicology.

The symptoms of the second grade of chronic nervous lead poisoning are as follows:—The muscles of the ball of the thumb are observed to become weak; sometimes they waste considerably before any further marked symptoms occur. To this follows a weakness of the extensors of the wrist, in consequence of which the hand cannot be freely bent back on the forearm. This generally progresses rapidly till the hand is helplessly dropped; and by this time there is usually great wasting of the fleshy mass on the back of the forearm. The supinators are usually also wasted and weakened, so that the patient cannot roll his hand outwards when resting the arm on the table. These affections of the muscles are commonly symmetrical, both arms being pretty equally affected. In some, but less frequent, instances the wasting and weakness affect also

the muscles of the upper arm and shoulder. As a rule, sensation is but little or not at all affected. In extreme cases the affected muscles waste almost entirely away; in such instances the interosseous muscles of the hand also atrophy, and the peculiar *main en griffe*, more commonly seen in some other nervous diseases, is produced.

Now, for this condition we possess a singularly limited range of remedies. Our first efforts must be directed to the elimination of the poison, for which we must give iodide of potassium in the manner already described; at the same time we must order a highly nourishing diet and cod-liver oil in pretty free doses. The circulation in the affected muscles must be encouraged by prolonged and frequent frictions of the skin. If, however, these means do not very soon induce some recovery of power, we must not waste time, because there is danger of the atrophy reaching an irremediable degree. We must, therefore, at once commence electrical treatment; and, fortunately, in this we possess a most powerful remedy. In the first instance we should always try the induced current; both poles should be placed pretty near together upon the affected muscles, each group being electrified for three or four minutes consecutively daily. Where the wasting has not gone very far the current usually excites contractions; but if after a few days' use we get no response to faradism, it is better to try the constant current. About forty cells will usually provoke contractions, except in cases where wasting has reached a hopeless degree; and after a few days or a week or two of this treatment we commonly find that irritability to the induced current returns; the cure may then be completed by faradism.

As an illustration of the extraordinary benefits sometimes caused by electricity, I may mention a case that some of you may remember. In 1870 a man, aged thirty-two, came to the out-patient department here, almost the whole of whose muscles of the right hand, forearm, upper arm and shoulder were atrophied to an extreme degree. The disease was singular in being confined to one limb; this was because the poison had been taken in only through the right hand, which constantly dabbled in the lead paints that he used in his trade. Here the constant current was used daily for eight weeks; faradaic irritability then returned, and in another month of treatment with the latter both the power and the bulk of the muscles were almost completely restored.

The third grade of nervous poisoning with lead represents that more profound influence of the poison in which the central nervous system is engaged. Most commonly it has been preceded by one or both of the stages already described. Usually it is announced by the occurrence of epileptiform fits: these

may either recur a number of times with intervals of comparative health, or the patient may almost immediately pass into a state of coma, from which recovery is very rare. It should be mentioned that this comatose condition is sometimes the precursor of death after an unusually severe attack of colic. There is generally very little to be done in the way of treatment when once the patient has entered on this stage of plumbism; but so long as he can be kept from actual coma it is always worth while to persist in the use of iodide of potassium and cod-liver oil; a rather free use of alcohol is also advisable. As a subordinate measure, both for preserving the action of the skin and rousing the vigour of the nervous system, it is very useful to employ daily frictions to the general surface of the body. Constipation, where troublesome, should be met by the persistent use of the constant current in the manner already described.—*Lancet, Nov.* 23, 1872, *p.* 733.

12.—ON RODENT CANCER.

By J. W. Hulke, Esq., F.R.S., Surgeon to the Middlesex Hospital.

Repeated examinations of the small hard knot or pimple, the precursor of the rodent sore, and also of the narrow hard border, have shown me that both alike are principally composed of masses of small roundish cells not unlike those of the rete mocosum, crowded together without intercellular substance, constituting a new tissue foreign to the normal tissues around it, intruding itself into them and wasting them, itself with their ruins undergoing destruction at a rate so nearly proportional to its renewal that its mass always remains small and inconspicuous. A tissue of this sort appears to have been found by Sir James Paget, and to have influenced him in rejecting with Mr. Hutchinson the rodent sore from cancers.

I cannot in this matter defer to these great authorities, for I have no doubt of the correctness of the view advanced and ably maintained by my former colleague, the late Mr. Chas. Moore, that the rodent sore is a genuine cancer—an opinion, I believe, shared by all my present colleagues. The rodent sore we regard as a variety of epithelioma; with the most typical examples of this it is connected clinically by intermediate cases (the third I have brought before you to-day, marked by outlying smaller ulcers, and by a more coarsely granulating base, is such a one), and anatomically by the frequent presence in some parts of every phase of cell between those resembling the tissue of the rete mocosum and the large flat scales abounding in the most typical epitheliomata. The great predomi-

nance of the smaller cells has probably led to the intermediate forms being often overlooked. Mr. Moore, in his book on rodent cancers, refers to their presence in some of the cases which I had examined for him, and I have since too frequently discovered them to have any doubt of their occurrence. Our former Surgical Registrar, Mr. H. Arnott, a very acute observer, has also found such transitional cell-forms.

The important difference between rodent cancer and the other forms of cancer is its limited diffusibility. In itself and in its relations to the normal tissues it is as genuine a cancer as any, but it infects slowly and only continuously the tissues around it, and its whole course is free from that remarkable upspringing of large numbers of secondary knots, from the infection of the lymphatic glands and of distant viscera, which characterise scirrhous cancer. It is this restrictedness which renders rodent the least malignant of all, and makes its complete extirpation frequently practicable.

In hospital practice less frequently than in private you cannot accomplish its eradication by excision alone, because most of those who enter our wards do not seek relief in the very early stage, when the pimple or very small sore might be easily and cleanly cut out, but they commonly wait until it has become a large, often deep, and irregular sore, parts of which are inaccessible to the scalpel. However, in the first case I have related to day, simple excision was practicable. This was done with the precaution of taking away with the sore a broad fringe of seemingly sound tissue. I was able to spare the extreme edge of the eyelid with its cilia. Had the raw surface thus made been left to heal by granulation, the scar would have dragged down and everted the edge of the lid and uncovered the eyeball. In order to avoid this I filled the gap with a flap of skin taken from the temple (adopting a plan very happily practised some years ago by Mr. Hutchinson). The immediate result has been very encouraging, and I hope the permanent one will not be less fortunate.

In the smith's case there were parts which the scalpel could not reach; and after cutting out the shrunken stump of the eyeball, with the remnants of the eyelids and all the hard border, the actual cautery was freely applied to the surface of the sore and wound; and when the bleeding had quite ceased the whole raw surface was coated with small pieces of lint smeared with an escharotic paste of chloride of zinc. This dressing was retained with a compress of cotton-wool and a few turns of bandage. Some of the wool was clipped away during the next few days, but the lint was not disturbed, and left to fall off with the eschar, which separated slowly. When at last it was exfoliated the wound was found already about

a third cicatrised, excepting at the two small spots mentioned in the subsequent history already given. Those, too, as I there mentioned, were readily destroyed. It is likely that in the further progress of the case such little upgrowths may be repeated, but they can be easily dealt with. I do not present the man to you as cured and safe, with absolute immunity for the future, but the relief he has obtained is immense, and his prospects are incomparably better than when he first came to us in 1869.

Resuming the narration of the third case—the widow in Whitbread ward—the same practice was adopted, but her indocility and obstinacy proved insuperable obstacles to success. The destruction of the little boss of granulations at the root of the nose, which she had deluded herself was a sprout from which a new nose would grow, made her persistently reject any further surgical interference at that time. Other small outlying indurations appeared near the margin of the large ulcer, ulcerated and coalesced with this, and cancerous granulations sprang up at the inner side of the right orbit and crept into the frontal sinus. Even then I would have made a desperate attempt at eradication, but she would not submit to the necessary enucleation of the eyeball, not believing that this would in the progress of the disease be soon destroyed, and I was compelled to abandon her to her pitiable lot. The pain in her brow is now very great, and she has frequent retching seemingly not provoked by any injesta. I fear the infiltrating cancerous tissue has spread through the posterior wall of the sinus into the brain. Even now there is no glandular infection, and no cachexia. The cancer is strictly local. All that can be done is to keep the sore as clean and inodorous as possible with Condy's or some similar lotion, and to soothe her pain with opium.

To conclude, some of the lessons which these and many similar cases I could furnish from my case-books teach us are—

1. Not to think too lightly of small, hard pimples and warts in the face in persons advanced in life, but promptly and thoroughly to excise them, especially if they show a tendency to grow, ooze, and scab. Their complete excision, together with a broad fringe of sound tissue, will probably secure a future immunity. It is advantageous to close the fresh wound when large with a flap of sound skin from an adjoining part.

2. Never to try to destroy them with nitrate of silver, as is too often done, because its action is too superficial and its use seems often to hasten their peogress.

3. When the surface of the ulcer is so irregular that complete excision is impracticable, it should be supplemented by

freely burning with a hot iron those parts which could not be reached with the knife, and by the free application to them of the chloride of zinc paste.

4. Some apparently desperate cases at an advanced stage may thus be treated very successfully if the patients possess confidence and docility.

5. Such composite operations are well borne by persons in advanced years if care be taken to avoid much bleeding.—*Med. Times and Gazette, Jan.* 11, 1873, *p.* 27.

DISEASES OF THE NERVOUS SYSTEM.

13.—THE PRINCIPLES OF TREATMENT OF MIGRAINE.

By Dr. Francis E. Anstie, Senior Assistant-Physician to Westminster Hospital, Editor of the Practitioner, &c.

Migraine is a neuralgic affection, usually of the fifth nerve, and belongs essentially to the period of bodily development. Before passing to the question of its treatment, let me dwell earnestly on one or two important additional points of pathological history, which ought to exercise a great influence upon the direction of our efforts. It was first noticed, I believe, by myself, but the observation has been specially confirmed by Eulenburg, that sick-headache most frequently occurs in patients among whose ancestors *epilepsy* had made its appearance; and there are some remarkable clinical features of migraine which, when once they have attracted our attention, immediately recall some of the warning symptoms of epilepsy; namely, the tendency to sigh and yawn, but more especially the strong *shuddering* which is often experienced before the attacks of pain come on. I do not mean to say that a migrainous patient must at all necessarily have had a positively epileptic ancestor; but I think there is high probability that the essential groundwork of the migrainous disposition is an inherited imperfect organization of larger or smaller tracts of the medulla oblongata, and that it is a matter of what we may call accident whether the break-down of nervous health takes the form of migraine, or of epilepsy, or of some other affection (*e.g.* asthma), which is merely allied to them, according as the morbid process affects chiefly the roots of the trigeminus, or the motor tract, or the roots of the pneumogastric, and so on. One of the most striking facts is the frequency with which we find, on careful inquiry, that persons actually suffering from some one of these forms of disease have previously suffered from one or more of the others. The influence which this doctrine of variable neurotic inheritance as a

principal factor in the causation of migraine must necessarily exert in our ideas as to prognosis and treatment, must even now be strongly suggested to your minds, and I hope to make it very clear to you.

When you are called, then, to a patient suffering from attacks of migraine, do not allow the outlying phenomena, so to speak, to divert your attention from the central facts as to the pathology of the disease. It is quite possible that the sufferer may complain of the horribly depressing feeling of nausea as much as, or even far more than, of the pain itself; and your impulse may be, not unnaturally, to attempt the direct relief of that sensation by various remedies addressed to the stomach; as, for example, emetics or purgatives to remove some imaginary peccant matter; or, on the other hand, you may be tempted to try a strong cordial stimulant, such as hot and strong brandy and water. The latter might, indeed, give relief; but if so, it would act not on the stomach itself but on the medulla oblongata, upon which alcohol exerts a powerful influence. There are a great number of reasons, however, why it is exceedingly desirable *not* to give alcohol as a direct remedy for nerve-pain; and fortunately in the case of migraine there is no necessity for doing so, for all that alcohol could do can be better done by other things.

Before you decide on using any particular remedy, you should try to make a provisional prognosis, both as to the duration of the existing attack and as to the future nervous history of the patient.

Now, if the sufferer be a young person, somewhere between fifteen and twenty, and the malady has not been going on for more than a few months, you will probably learn that the attacks last for some hours, but that sleep quite puts an end to them, and next day, very likely, the patient scarcely feels as if anything had ailed him, the only reminder being a slight diffuse soreness of the scalp. Of course you wish to relieve his present pain; but is there a likelihood that the curtailment of one attack will in any degree tend to prevent or delay the periodic recurrence of the affection? Probably it will not do much in this way; for although in neuralgias, which are naturally of more frequent recurrence—returning daily or oftener—we may do most essential service by merely breaking the chain of attacks, we seem to have far less power to effect permanent good, in migraine, by the mere temporary arrest of pain. However, it is well worth trying to cut short the pain. The first thing you should do is to plunge the patient's feet in hot water containing a handful of mustard-flour, and let him inhale the steam that rises; the joint effect of warmth to the feet and of the inhalation of mustard-vapour will often pro-

duce drowsiness, and on lying down the patient will feel inclined to sleep. It is admissible to assist this feeling by the administration of a dose of chloral, 20 to 30 grains; but, unfortunately, this cannot always be tolerated by the stomach. Under these circumstances I still advise you to abstain, if possible, from forcing sleep by the use of opiates; and there is one important remedy which, in various forms, is available. The alkaloid caffeine (obtained from coffee), and the substantially identical theine (from tea), and guaranine (in the form of powdered paste made from the fruit of the *Paullinia sorbilis*), are each of them calculated to produce a peculiar effect in relieving the pain and enabling the patient to get repose. In a rough, but not fully satisfactory way, you may sometimes get these effects by administering strong tea or coffee; but much better is the administration of caffeine, in doses of one or two grains by the mouth, or one-half to one grain subcutaneously injected. Lastly, on the recommendation of Dr. Wilks especially, the guarana powder (which is practically a convenient form of impure caffeine) has been brought into fashion in this country, and promises to be exceedingly useful. I gave it, not long since, to a lady suffering from extremely severe migraine complicated with cardiac neuralgia: two of the guarana powders (now sold by all the principal London chemists), given at an hour's interval from each other, gave complete relief to the attack. If we are to believe Riedel and some other German observers, the use of caffeine will not merely give relief to individual attacks, but finally diminish the tendency to their return; this is a question, however, which requires to be further examined. If chloral be impossible, and caffeine or guarana has failed, we may even yet try one remedy—Indian hemp—before resorting to opiates; it should be given in quarter or half grain doses of a *good* extract, repeated in one hour's time if sleep be not induced. If driven to the employment of opiates, we should give one-sixth of a grain of acetate of morphia by subcutaneous injection.

We must do our utmost to bring about a radical change in the tendencies of the nervous centres. The first thing to be looked to is the patient's state of general nutrition, and you will often find much here that requires prompt interference. In a great many cases, indeed in the majority, the sufferer from migraine firmly believes that he (or *she*, for migraine is much commonest and most intractable among women) has proved to demonstration the unwholesomeness of all articles of food but some two or three, and of the general advisability of keeping to a semi-starvation allowance. Especially these people are afraid of taking any form of *fat;* they believe that

such things are bilious, and specially likely to aggravate their complaint. Now, nothing can be further from the fact than these notions, in my opinion. You will never make much progress in the cure of the migrainous tendency till you have got your patient to eat and to digest a really good supply of nutritious food: and you will find that fat, so far from being specially objectionable, is particularly useful, as my colleague Dr. Radcliffe first showed. Cod-liver oil is the best thing, if it can be taken, but very often the patient will not or cannot bring himself to touch it at first, so we must begin with very small quantities of Devonshire cream or plain cream, and so get on by degrees to cod-liver oil; and by the time that the patient has come so far as to take the latter to the extent of six or eight drachms daily, you will often notice with surprise how much less fastidious the appetite is with regard to miscellaneous articles of diet. Upon this soon follows a real improvement in the nervous symptoms: the attacks probably become less frequent, losing their rhythmical character, and when they do occur the pain is more tolerable, and seldom culminates in a burst of vomiting.

The effect of cod-liver oil is much aided by iron, as you might expect in cases where there is decided anæmia, the lips and gums being pale and the tongue marked by the teeth: it is best to give the saccharated carbonate in full doses, 10 to 20 grains three times daily. But I do not believe iron is any use in the majority of the cases which are not anæmic.

Migraine shares to some extent the peculiarity of all neuralgias of the first division of the trigeminus to be benefited by quinine: but I beg you not to fall into the common error of thinking that every periodic affection is to be treated with quinine. You may look on the practitioner who flies to quinine on every occasion when a nervous disorder shows some rhythmicality of recurrence as a probably ignorant person. As to migraine, most cases that are curable at all are curable rather by the tonic and dietetic plan above described than by quinine. Arsenic, however, does seem, in some anæmic cases, to act more efficiently than iron both in improving the blood-making process and in lessening the tendency to pain. And on the whole I am inclined, for the future, when quinine does seem indicated, rather to give a prolonged trial to caffeine or guarana, which appear to have a more decided influence than quinine.

In cases where migraine, without taking on any dangerous form, simply becomes converted into an ordinary trigeminal neuralgia without stomach complications, and with no regular periodicity, but coming on with severity on occasion of any great fatigue or shock, we have chiefly to trust to the influence

of prolonged tonic regimen, and may indulge a fair hope that as the frame consolidates and grows strong, the affection will gradually wear itself out: such has been the course of events in my own case, and I know many other patients who are now scarcely ever troubled with a bad attack. For women, the entire change of life produced by marriage not unfrequently disperses the last remnants of a migrainous tendency; but, *per contra*, married life has certain dangers which may tend to revive the neuralgic disposition; such as pregnancy and (much more frequently) the depressing influence of severe labours with much flooding, or of lactation. Occasionally, indeed, we meet with an unlucky woman who, being a subject of migraine at the time of marriage, continues to suffer from it throughout the whole period of sexual life, with severe aggravations whenever any physiological crisis takes place: fortunately these cases are comparatively rare. On the whole, migraine may be described as a youthful neuralgia, tending for the most part to extinguish itself after passing through transitional form, but occasionally proving to be only the first symptoms of formidable diseases, such as epilepsy, asthma, angina pectoris, or facial neuralgia of the more violent and persistent type.—*Practitioner*, *Dec.* 1872, *p.* 348.

14.—ON CERTAIN FORMS OF VISCERAL NEURALGIA.

By Dr. Clifford Allbutt, Leeds.

[Neuralgia of internal organs has only lately received the attention which it deserves.]

Gastralgia is perhaps the commonest form of pain from which some neurotic patients suffer, and it really is so easy to distinguish from dyspepsia that one regrets the more they so commonly are confounded. Its occurrence in the persons I have described makes it scarcely necessary to add that it is far commoner in women than in men. I do not remember ever seeing it as a larval form of malarious disease. Our present physiological knowledge discredits its supposed connection with the cœliac plexus, and refers the seat of pain rather to the vagus; this, indeed, our clinical knowledge supports, for Anstie has shown that gastralgia often runs with angina and with asthma. It occurs mostly after the following fashions: sudden and violent pain may seize the gastric region, sometimes biting right into the epigastrium, sometimes darting through to the back, sometimes gnawing at almost all the sternal region, sometimes twisting and griping from the epigastrium round the false ribs to the left. The attacks may come on so suddenly as (in one case now under my care) to

interrupt the sufferer in conversation and drive him into another room to writhe in secret, or they may come on more gradually and never reach any great degree of intensity. In either case they have periods of greater and less severity, and of actual remission long or short. Pressure, as in colic, generally relieves rather than aggravates, and the attack passes off to recur at intervals which seldom seem to observe any remarkable constancy. With the sensory disturbances are often associated motor disorders. In one marked case—that to which I have already alluded—the stomach is the seat of volcanic movements of a flatulant character, as flatulence is associated also with abdominal colic. Twistings and irresistible gatherings of wind, which belch loudly from the throat, may accompany, follow, or replace the gastralgia, are dreaded by the patient as much as the pain, and are amenable to like palliatives,—to subcutaneous morphia, for instance,—while they set all alkalies, carminatives, antiseptics, and stomachics at utter defiance. In other instances some catarrh of the stomach is associated with gastralgia, as diarrhœa may accompany "enteralgia," but this is less common. More common is vomiting, which may be spasmodic or may be a revolt of the hyperæsthetic stomach against the touch of the food. In the case of Sarah S., which I shall presently describe, the vomiting was a very prominent symptom. In some cases functional disturbances elsewhere seem not only to be an outcome of the same general habit, but to be directly consequent upon the gastralgia itself, though, of course, this is hard to prove. Irritable heart and wiry pulse, however, are very often associated with gastralgia in a way which seems rather direct than indirect. Asthma and angina seem rarely to have the direct but often the indirect connection, as they occur, not at the same time, but at different times, in the same person. Spasm of the abdominal walls is often present; perhaps we should always find it if we stripped the patient. The recti abdominis are knotted and the belly and epigastrium are nipped into hollows. This is mainly a reflex act, and the parts are at once released (as I have had occasion twice to notice) by a few whiffs of chloroform. "Points douloureux" seem scarcely to exist; certainly the epigastrium is rarely so tender as in dyspepsia and gastritis. Most persons, unless of a very vigorous and hard condition, have occasional tender vertebræ; and few women will not complain of differences in places when the spinous processes are successively pressed. The paroxysms may give way as suddenly as they came, or they may vanish slowly; the intervals are generally complete, or nearly so, but the motor disturbances may intervene and the interval be diversified by uncontrollable belching or capricious vomiting. Nausea, I think, is rare. Now, from

what has gone before, it will be seen that the confusion between gastralgia and dyspepsia is not to be excused. There is no sharp pain from the epigastrium to the shoulders, consequent only upon injection of food, and relieved by vomiting or the prone position. The pain takes its own times of ebb and flow quite independently of digestion, for in some cases indeed food gives relief; not long ago I almost cured a gastralgia by advising a patient, who had been starved for dyspepsia, to go home and live as generously as he could for a fortnight. He was utterly amazed to find that, so far from being the worse for it, he was actually better and better. Nor are there any truly dyspeptic symptoms: the tongue is rarely coated; red at tip and edges it may be, but often it is of thoroughly normal aspect; nor do the other symptoms, as observed in the secretions, in abnormal vomits, risings, acidity, and the like, bear out the supposition of present dyspepsia. At the same time, the mucous membrane of these neurotics is often irritable, and may also be subject to intercurrent catarrh. In the vapourous neuralgics the tongue is frequently large, flabby and white at the back, the breath rather faint in odour, and constipation invariable; while, in the irritable neurotics, the tongue is nearly always small and often red at the tip and edges, the breath, however, being sweet, and the motions, though often constipated, yet often again running into diarrhœa. Bismuth with small opiate additions, or oxide of silver, are not uncommonly necessary in the kind of dyspepsia which may undoubtedly complicate gastralgia.

It is with unusual pleasure we enter upon the treatment of gastralgia, for, instead of admitting our weakness, here we are certainly strong. Individual cases may indeed thwart us; but, as a rule, we can hardly fail to bring considerable relief. The continuous current I have rarely tried in visceral neuralgias, and, gastralgia being so often a complaint of women, it is seldom convenient to make any local application of this remedy. The first step to be taken, after forming a diagnosis, is to assure the patient that his complaint is not dyspepsia but neuralgia, and to put him upon diet as liberal as the worried stomach will tolerate. This must be done carefully. There are to be no large full meals, but small quantities of light nutritious food at frequent intervals during the day. Rum and milk in the morning, a little meat for breakfast without much slop, a raw egg or a basin of soup at noon, a chop at the luncheon hour with a glass of sherry and vegetables in moderation, tea and bread and butter at five, meat and light pudding at half-past six with another glass of wine, and before bed a small cup of revalenta with a biscuit. Cod-liver oil will in most or many cases be required. And the patient, being

released as to diet, must now be strictly warned as to the real causes of his ailment; anxiety in home or business, many important engagements, prolonged suckling, teaching in schools during hours due to relaxation, reading at night, social dissipations; all these causes of "wear" must be enquired into and disposed of. The next important indication is to administer such medicines as the case seems to call for on more general grounds. Anæmia, which cannot alone cause gastralgia, but often favours its manifestation, must be met by steel and aloes. I think Dr. Anstie has said that the tincture of the sesquichloride of iron seems to have a special power over neuralgia—a power which can scarcely be due to a mere improvement in the blood. This may be so, certainly in one case of obstinate frontal neuralgia with a white lock of hair, which was long under my hands, and in which everything, galvanism included, had failed; in this case large doses of the tincture of the sesquichloride succeeded better than any other remedy. But the same thing used to be said concerning the carbonate of iron, and probably with equal truth; so that the special virtue, if any, resides in the metal, and not in one of its salts alone. It would appear, then, that in iron we have two kinds of value; its value in ordinary small doses and in mild forms when it removes simple anæmia, and its value in large doses—doses such as half a drachm to a drachm of carbonate of iron, or of twenty to thirty drops of the sesquichloride tincture—when it seems, apart from the presence of any definite anæmia, to have a special effect in modifying the morbid state of nerve tissue. The same is true in some sense of quinine. This drug may be used in common doses of about a grain as a simple tonic, or in doses of ten to thirty grains as an anodyne. But I have here to refer to its use in the former way only, for large doses of quinine seem to have little palliative value in gastralgia, a fact which surprised me, seeing that the trigeminal centre and the vasomotor centre, over which they have such power, are close to the nucleus of the vagus. Probably, however, quinine governs trigeminal neuralgia indirectly through the intermediation of vasomotor change. Be this as it may, small doses of quinine with strychnine make a capital chronic medicine for gastralgia; but large doses, as rapid agents, in this ailment seem impotent. In the above combination the strychnine is, however, the more valuable element, and few cases of gastralgia get on altogether without it. It probably acts best when given under the skin; but, until baffled in other attempts, one scarcely resorts to this form of administration. In the few instances where I have thus tried it I have seen excellent results. Small doses should be repeated daily for several days, and the medicine carefully strengthened, if necessary, as its effects are seen.

But of all the remedies for gastralgia arsenic is king, and to the use of arsenic I was led, when ignorant of its use by others, by noting the frequent concurrence of certain skin affections with gastralgia. Eczema, psoriasis, lichen, herpes, urticaria, all run with gastralgia in the irritable neurotics, and the eruptions generally occur in active, spreading, itching, hyperæmic, symmetrical forms. In gouty persons, on the contrary, they are generally circumscribed and chronic. Arsenic, then, has some remarkable power, not over skin affections in general, but as they occur in these neurotics; and it likewise cures or relieves their migraine, their tics, their asthma, their angina, their gastralgia, their colic, their capricious diarrhœa. Arsenic has not any specific power over skin affections merely as such, and hence the frequent disappointment of those who so use it; but it is a remarkable modifier of a certain peculiar constitutional habit, of which, probably by way of the nervous system, it obviates the morbid tendencies. I always prescribe Fowler's solution in any simple water, a dose of which, containing three to five drops of the solution, is taken largely diluted thrice daily with meals. It should be carefully pushed to the edge of its physiological effects. The only palliative remedy of any importance is morphia used hypodermically, and of this I shall treat when I come to speak also of ovaralgia; of the lesser palliatives the best I think are ether and chloroform given internally in small doses.—*Liverpool and Manchester Medical and Surgical Reports*, 1873, *p.* 111.

15.—ERGOT IN HEADACHE.

Dr. Silver, of Sidney, Ohio, states in the Medical and Surgical Reporter, that ergot is better for headache than any other single article in the materia medica. He recommends it to patients who are subject to the malady thus:—℞. Squibb's fl. ext. ergotæ, gtts x—xx for one dose. To be repeated every half hour until relief is obtained, or four or five doses are taken. The primary effect of opium is to produce hyperæmia of the brain, To neutralise this action Dr. Silver employs with it fluid extract of ergot, and says the combination has a happy effect in cases in which opium alone would be coutra-indicated by the fluxion of the brain. He does not regard ergot as a specific for headache, but thinks thousands of people are made miserable once a fortnight or once a month, who, by the use of it, may be made, for the time, comfortable. His experience with ergot in the headache of fevers is limited; but he would expect no good result from it, since the pain is then, probably, produced by the abnormal temperature and *quality* of the

blood, instead of being occasioned by fullness of the cranial vessels, as once supposed.—*Medical Press and Circular, Feb.* 5, 1873, *p.* 119.

16.—ON SOME DISEASES OF THE NERVOUS SYSTEM.—SPASMODIC AFFECTIONS.

By Dr. Samuel Wilks, Physician to Guy's Hospital.

There is scarcely a nervous disease having an organic cause but may have its counterpart in a functional one, and be cured by galvanism or other means. I must make an exception in regard to contraction and spasmodic affections of muscle. These diseases, in my experience, constitute the most difficult to explain or to treat in the whole domain of clinical medicine. The physiologist has not yet determined the true relation of muscle to nerve, for we have on the one hand evidence of the power of contractility in the muscle when separated from the nerve, and, on the other hand, there is the fact of the muscle losing its tone in paralysis, as seen in the muscles of the face when the portio dura is affected, and in the experiments of Marshall Hall already referred to. If the dropping of the muscles of the face argues want of nerve influence, and the falling of the head in sleep the same fact, how are we to regard the case where a muscle is kept in undue contraction? An over nerve stimulation would be the most reasonable answer, for if the muscle relaxes when we become unconscious in sleep, we are bound to believe that we are sending a stronger volitionary force through the nerve, when by a voluntary effort we cause it violently to contract. In poisoning by strychnia we say the tetanic convulsion is produced by over excitation of the cord. We suppose the same occurs in tetanus, and in the convulsion produced by the irritation of a peripheral nerve. In tetanilla there is a paroxysmal excitation of the cord In epilepsy it is the summit of the cord in the central ganglia which is thrown into excitation, and if the the cause be an evident one it is found to be an irritant on the corresponding surface of the brain. If a tetanic condition be owing to an evident and tangible cause, this is found to be an acute meningitis of the spinal cord either resulting from injury or in the form of the epidemic cerebro-spinal meningitis. In an inflammation of this kind the whole phenomena of tetanus may be observed. The cord itself is healthy, but excited to overaction by the implication of the roots of the nerves, for there may be not only opisthotonos, but general rigidity of the limbs accompanied by pain in them and hyperæsthesia of the whole body. In spinal meningitis there is often exquisite pain on moving the limb, but whether this is purely muscular or due to an

inflammation of the nerve is not very evident; sometimes in recent hemiplegia a painful contraction of the arm is observed. There is hyperæsthesia and hyperalgesia. If these symptoms have come on slowly we are still right in supposing that there is a meningitis, but that it is of a chronic character. Such cases are very common; cases where there is a commencing loss of power with altered sensation, and at the same time a rigidity of the limbs ending finally in their permanent contraction. The condition is explained by a chronic inflammation of the membranes of the medulla, including the roots of the nerves which are attached to it. In some of the most marked instances of contraction with only a partial loss of true spine function, a thickening of the membranes has been found. In such cases Charcot and his followers have diagnosed a sclerosis of the cord itself, but there has not been a sufficient number of cases recorded in this country to corroborate his statements. These cases are so chronic in character that they usually come to a termination in a private home or a workhouse, and thus the opportunity for examination is lost.

In the first case given below there can be little doubt that the symptoms point to an acute spinal meningitis. The next case is a similar one, where the inflammatory process has been a little more slow; and in the third where the legs are contracted a still more chronic and local affection has been present. If in such a case as the last we suppose the meningitis to involve only the lower portion of the cord, we can easily believe in a local meningitis of any other portion. Thus, in the following case it was a question whether a supposition of this kind should be made or the case be regarded as one altogether functional. A woman sent to the hospital by Mr. Lush, of Weymouth, had paroxysms of spasm of the flexors of the forearm causing contraction of the hands, and, at the same time, some apparent loss of power of the whole muscular system of the body. In all such cases an efficient cause is found in meningitis of the cord and its attached nerves, since post-mortem examination has proved in many instances that such a condition has existed with the symptoms above named. When, however, one limb or a single muscle is affected a considerable difficulty of explanation arises, and no clear idea is gained by saying that a child who suddenly gets a strabismus or a contracted leg is the subject of cerebral disease, or that a girl who possesses a spasmodically contracted arm has spinal irritation. The exact pathology of such cases has yet to be discovered, and it is very evident that there is a large field for research in the morbid changes of the nerves themselves, not only at their spinal origin, but throughout their course. One of the most common of these obscure affections is wryneck, as

in a case I give below, where all means of cure were inefficient; an experience which corresponds I believe with that of most medical men. Sometimes the muscles of the jaw are affected and the spasm equally intractable. A medical friend has a patient with this idiopathic trismus, who is quite unable to open her mouth on account of spasm of the masseter, and who has taken a variety of medicines in vain.

In the second case given below it will be seen that although it was treated early there was no arrest of the disease.

In speaking of wryneck there is a fact worthy of observation and further investigation ; that in young persons subject to this affection the head and face on the contracted side do not develop as on the other, and in consequence there is a want of symmetry in the countenance when narrowly examined from the front. One eye is slightly lower than the other, and the whole of that side of face and head is smaller than on the other. In a lad lately in the hospital with heart disease a wryneck existed from infancy, and this remarkable want of symmetry was very evident. In a young lady patient, also, who is otherwise well grown, this disproportion of the two sides of the head and face is well shown. It may be asked whether this is due to some failure of nervous influence having its foundation in the same cause which produced the wryneck, or whether the contracted muscle itself exerts an influence on growth, and, if so, whether the division of the sterno-mastoid would allow development again to proceed. I relate below the case of a man with wryneck, to show how little influence galvanism had over the spasmodic contraction. The fourth case is one of tetanilla, which I report in consequence of attention having been directed of late to this affection. There was a point of interest as regards diagnosis, for the case being attended by febrile symptoms a suspicion of meningitis existed rather than that the case was one of a simple spasmodic affection ; as, however, the patient quickly recovered, the diagnosis must be given in favour of the latter.

Case 1.—*Acute Spinal Meningitis.* (Seen on Oct. 10th, 1872.)—J. F., æt. 12. Two weeks ago began to feel some weakness in his legs, which made him stoop when he walked. He was a quick intelligent boy, and, as a kind of amusement, he made himself some crutches, saying he must take to them. At the end of six days he was unable to walk, and had to keep his bed, and a medical man was sent for. He was then lying on his side, with his legs drawn up and complaining of pain in them. All these symptoms increased until I saw him on October 10th. He was then lying on his left side, with his legs drawn up, his knees to the abdomen and heels to buttocks. On touching his

legs, or on attempting to move them he screamed out with pain. The muscles were hard, as if spasmodically contracted, and the tendons were rigid. The skin was also extremely sensitive, the hyperæsthesia extending all over the limbs and reaching as high as the umbilicus. Towards the back and over the lumbar region the sensitiveness was extreme. His condition was one of spasmodic contraction of the legs accompanied by pains. He had hyperalgesia and hyperæsthesia.

On inquiry about an injury the lad stated that on the 24th August he was playing with another boy, who was carrying him, when he fell off on to his back, striking himself on the kerbstone. He felt great pain for a moment, but this passed off, and he thought no more of it. He was ordered liq. hyd, perchlorid. and potass. iodid., with ice to the spine. He remained in much the same state as above described for a few days, with the exception of having regular attacks of opisthotonos, and then gradually grew better, and to-day (November 4th) the severe symptoms have mitigated, spasm being less and pain less.

Case 2.—*Chronic Meningitis.* (Reported by Mr. Wilkins and Mr. Nunez.—Wm. B., æt. 10, admitted under Dr. Wilks, May 15, 1872. He stated that ten months ago he received a blow between the scapulæ which hurt him very much and required the advice of a doctor. He stayed at home for a week, being unable to walk on account of the pain in the back. He afterwards again went to school for eight months, but never lost the pain. Six weeks ago he began to lose power in his legs, and the weakness has gradually increased up to the present time.

On admission.—He was seen to be a well-grown boy, and did not look ill; he could not walk without assistance, being only just able to stand alone. His only symptom was partial loss of power. Sensation unaffected, On the supposition that some inflammatory process might have been set up by the injury he was ordered the liq. hyd. perchlorid. ʒ j, and potass. iodid. gr. iv, three times a day.

After four weeks he thought his legs were a little stronger, that he could move them better, and was able to stand. He continued his medicine, but at the end of another month it was evident that there was no real improvement, for he was beginning to feel pain in his legs, at the same time they were less sensitive and the muscles were beginning to be rigid. There was also some weakness of the bladder.

On July 9th he was galvanized. When a continuous current of thirty cells was applied to the spine, the arms were moved outwards, and the legs drawn up in jerks. Faradization to

spine had no effect, and when applied direct to the legs the muscles did not respond.

At the beginning of September the spasmodic contraction was increasing so that he had a sand bag placed across his thighs to prevent them being drawn up. Continuous current been used daily to the spine. He was ordered gr. $\frac{1}{4}$ of ext. physostigmatis three times a day, and after a week it was increased to gr. $\frac{1}{2}$. By mistake he took a double dose, 1 gr. He soon became very ill, and when the house physician was called to him an hour afterwards he found him with a clear froth coming from his mouth, perspiring profusely, his face turning blue, hands cold, numb, and almost powerless. Pupils of natural size. Pulse 130. Quite sensible. He had an emetic powder followed by warm water, and three hours after taking the pill he had quite recovered.

The above-named paralytic symptoms increased, at the beginning of October the legs being quite rigid, so that by lifting the heel the whole body could be raised, the knees were bent with great difficulty, but, if so, the legs suddenly contracted or flew up to the body. Sensation had also become much impaired as high as the sixth rib. Almost complete loss of power of bladder. Ordered succ. conii to see if it had any influence over the spasm, and he took it a few days, but with no result. It was observed that his abdomen was flaccid immediately after raising his clothes, but upon feeling it the recti became quite rigid. The same fact had been observed before in the legs, that they became much more rigid after being touched.

On November 1st limbs again tested by galvanism and faradization. The muscles responded to both, but their susceptibility was impaired, being much less than that of the arms.

Case 3.—*Chronic Meningitis.* (Reported by Mr. D. B. Lees).—James M., æt. 33, a sailor, had genital sore, but it is very questionable whether he has had constitutional syphilis. Six months ago, whilst in the Mauritius, he began to feel weak in his legs and to walk as if he were tipsy. The weakness gradually grew worse, and the limbs were beginning to contract when the doctor applied a red-hot iron three times on each side of the spine. No good result followed, and the contraction gradually went on, especially in the right leg. Whilst on shipboard he used to keep the leg forcibly down by a weight.

Admitted to hospital on October 21st. When placed in a chair he sat with his knees drawn up to his chin, his knees next his buttocks. The legs quite rigid, so that by attempting to extend one of them his whole body would be lifted up. The right leg, which was first affected, was more rigid than

the left. The knees came together, although one was a little lower than the other. No pain over the spine. No difficulty with bladder. The muscles hard, extensors somewhat wasted, tendons rigid. He was placed under chloroform, when the left leg was readily extended, but the right could not be moved from its position. Tested with galvanism. On applying the continuous current to the extensors of the left thigh, and making and breaking contact, the muscles responded, but this was more marked when faradization was used, the limb then becoming nearly straight. The muscles of the right leg acted in the same manner, but with no tendency to straighten the limb. Sensation unimpaired.

Case 4.—*Torticollis.* (Reported by Mr. C. Knott.)—Alfred G., æt. 37, admitted February 28th, 1872, and left June 23rd. Works at oilcloth factory. Always enjoyed good health, and his habits were steady and regular. Never had any severe illness. Exposed to cold. About a twelvemonth since he found his head becoming gradually drawn to one side, his face looking to right shoulder, the muscles of the neck stiff, and some little difficulty in swallowing. This continued until admission.

Patient looks well, and whilst lying on his pillow his complaint is scarcely apparent, as he moves his head from side to side; but immediately he rises the left sterno-mastoid contracts, and his head moves to the right side.

Faradization was used to the left sterno-mastoid muscle, and caused marked contraction. This was continued daily, and after some time the muscle seemed more readily affected by a less strong current. It seemed, indeed, as well as the trapezius, to have greater excitability than the muscle on the other side. The continuous current from twenty Daniell's cells was then tried, and had no effect on the left sterno-mastoid, although it caused contraction of the platysma, whilst it produced the usual effect on the sterno-mastoid and trepezius of the right or unaffected side. The two forms were tried for six weeks, but without any permanent benefit, and were, therefore, discontinued. He was then ordered injections of arsenic for nine days, but without any result. He subsequently took bromide of potassium and then tr. cannabis, and on some days he thought he was better and the muscle more supple; but he again became as bad as before. A consultation then took place with the surgeon about the propriety of an operation for dividing the muscle or the muscular branch of the spinal accessory nerve; but the patient not approving the proposition left the hospital unrelieved. — *Guy's Hospital Reports, vol.* xviii., 1873, *p.* 135.

17.—ON CHOREA AND ITS TREATMENT.

By Dr. Willoughby Francis Wade, Physician to the General Hospital, Birmingham.

What is the best plan of treating ordinary cases? In the first place, knowing that some at least will get well if placed in suitable conditions, we have to say what conditions are suitable. Amongst the most important is a sufficiency of good, plain, wholesome food. Even more important than this, in my estimation, is rest in bed, which keeps the muscular and nervous systems in the greatest attainable repose, and thus prevents wear and tear; it also secures an uniform warm temperature. I prescribe two tablespoonfuls of compound decoction of aloes twice or thrice a day, as these patients are very often constipated; and an aloetic purgative is more likely than any other to bring away ascarides or joints of tapeworm, should any be present; and we know that worms seem to be sometimes the exciting cause of chorea. It is not desirable to produce much action on the bowels; and, to avoid this, it may be necessary to omit or diminish the medicine.

Under these circumstances patients often begin to improve very soon, and in not a few of them the improvement is continuously progressive. When this is so, I act upon that greatest of therapeutic maxims, "Let well alone."

One word upon the way to ascertain whether they are improving or not. I often see cases of chorea that, so far as I can judge from my own observation, are stationary, whereas the nurse assures me that they are much better. The nurse is always right. She sees them continually throughout the day. I see them for a short time only; and my speaking to them produces emotional excitement, and enhances their movements. Occasionally the converse happens; the visit produces a sedative effect for the time, and the patient seems better, though not really so. This temporary sedation is commonly followed by increased agitation. These are not the only cases in which you may get valuable opinions from nurses; and my advice to you is, never to neglect this source of information; and do not be affronted if the nurse tells you that the patient is worse since you changed his medicine, or otherwise disparages your judgment. You need not, of course, take all that a nurse tells you for gospel, but must exercise your wits in sifting the chaff from the wheat. In our present case, I learned in this way the interesting fact that the man's involuntary movements are greater if he gets fatigued.

If the patient do not begin to improve in a few days, or if his improvement be not continuous, it is, in my opinion, needful to do something more. There are certain drugs which enjoy a

certain repute as controllers of choreic motions. The chief are preparations of zinc, of iron, and of arsenic. When I first came to this hospital I found chorea commonly, if not invariably, treated with sulphate of zinc, and accordingly adopted it. I begin, then, under these circumstances, with two or three grains of sulphate of zinc in water three times a day. Many cases get on very well without augmentation of this dose; but I will not affirm with positiveness that in such cases the recovery is not spontaneous. In a good many cases, however, it is evident that this dose is insufficient. If that be apparent, I increase it, and determine the amount of increase upon principles which have, at all events, the merit of being definite. Sulphate of zinc is one of those drugs which produce distinct effects if given to a healthy person. In a sufficient dose it causes vomiting, in a less one nausea. There are others, such as arsenic, quinine, belladonna, &c., which have what is generally styled a physiological, but which would with greater accuracy be termed a pathological, action on the human body. Now it seems to me that we may reasonably lay down the following therapeutic axiom.

Drugs which have a physiological reaction have not had a fair trial unless they produce either

a. Diminution of the symptoms or disease for which they were given; or

b. Their recognized physiological action.

That is to say that, until they have produced their physiological action, they cannot be pronounced to be impotent to produce the intended curative effect. If the curative effect be produced, we have no desire to see any physiological effect; which, indeed, we shall probably be much better without.

With regard to sulphate of zinc, I have repeatedly found slight physiological effects—viz., nausea coincides with distinct therapeutical effects, and a smaller dose is in rebellious cases inoperative. For example, the patient improves only when each dose produces slight nausea; and when the stomach has become inured to that dose, as it will in a few days, improvement ceases, to recommence so soon as the dose has been augmented to a nauseating quantity. It is surprising what a large quantity is at times required to satisfy this very plain and practical test, as we shall see directly, when we come to examine into our present case.

I should have mentioned that the dose sometimes causes a spurious nausea, due, not to emetic action of the drug on the stomach, but to the fact that the dose is disagreeable to the palate. Before discovering this, I was much puzzled by a case where the nurse told me each dose produced nausea, and yet the symptoms did not yield, as they soon did to a suitable dose.

In our present case the patient, a man, is forty-five years old, and has been affected for twelve months. I have never seen a patient nearly so old as this, and I am not aware of any case in which simple chorea has commenced so late as forty-four; though cases are recorded of women in whom, commencing about forty, it had lasted seven or eight years, making them at the end of that time older than our patient. He has been all the time in comfortable circumstances, and had not lost weight before admission, nor has he gained since; we are therefore entitled to assume that his improvement is not due merely to improved circumstances, but may fairly be attributed to medicine. Twelve months was quite long enough to leave the case to nature to cure if she could, but she could not. His general health was good. The disease commenced in his feet, and gradually spread over his body, so that, on admission, his legs, arms, head, face, and tongue "danced," and had done so for many months. He was not confined to bed, as adults often rebel against such treatment, and I was anxious to keep him under observation; and I confess that it seemed to me more probable that it was a case of organic disease than of pure chorea, and that his chances of recovery were limited, for it is an undoubted fact that chorea may depend upon organic disease of the nervous centres. He was ordered two grains of sulphate of zinc in water, one grain to be added to each dose day by day—*i.e.*, on the second day he took three grains for each dose, on the third day four grains, and so on. Day after day, day after day, no amendment. The first time the nurse said she thought him a little better, was on the day that each dose contained thirty grains. The dose was still augmented, till he took two drachms in one day. No nausea was excited. But the bowels having become relaxed, as I thought possibly from the drug, I reduced his daily allowance to one drachm, and in twenty-four hours the diarrhœa ceased. Improvement, which was at first most apparent in the parts latest attacked, still continued, and he is at the present time much improved, though still not well, and I am still inclined to the opinion that the case is probably one of organic disease. There is no sign or symptom of cardiac or arterial disease. Now, I have already said that, in my opinion, we may fairly connect the treatment and the improvement as cause and effect, and I think that so considerable a result in what may turn out to be a necessarily incurable case, in consequence of organic changes, speaks most strongly in favour of the efficacy of the treatment. There remains the question, Would a small dose have been equally efficacious with the large one? I think not; firstly, because I have seen many cases where a large dose was needed to produce any sensible or obvious effect upon the symptoms;

secondly, because here no amelioration was discovered till the dose was, and for some little time had been, a considerable one. I should not have cared about the diarrhœa but for two reasons; one, because diarrhœa is a troublesome and unpleasant circumstance; the other, because it has been said that a continuance of large doses of sulphate of zinc may produce marasmus. If this be so, it is unwise to run the risk of such a result; and irritation of the mucous membrane of the intestines, such as diarrhœa indicates, may certainly so destroy the absorbent power of the intestines as to induce marasmus.

This case, then, which is in many other respects so interesting, illustrates these four points.

1. Chorea does not always wear itself out and get well spontaneously.

2. Sulphate of zinc does exercise an influence over choreic movements.

3. The stomach and system at large will at times tolerate much larger doses of this drug than are commonly given.

4. Doses of unusual magnitude may be required before any curative influence is manifested.—*British Medical Journal, Dec.* 28, 1872, *p.* 712.

18.—CLINICAL ILLUSTRATIONS OF THE VALUE OF PHOSPHORUS IN CERTAIN FORMS OF DISEASE OF THE NERVOUS SYSTEM.

By Dr. W. H. Broadbent, Physician and Lecturer on Medicine, St. Mary's Hospital.

A method has recently become available by which phosphorus can be given in a form at once active and inoffensive, namely, dissolved in oil or lard, and enclosed in a gelatine capsule; the dose is about $\frac{1}{30}$ of a grain, and it may be taken two or three times a day, always after food. In the following cases this has always been the mode of administration.

1. *Severe Neuralgia with peculiar complication.*—The patient, a lady aged about 25, had suffered more or less from sick-headache or migraine, from girlhood. After her marriage she had children rapidly, and being weakened in consequence, the attacks had become more frequent and violent, and had changed somewhat in character, having assumed more the character of distinct neuralgia of the first division of the fifth nerve, which, as Dr. Anstie has pointed out, is a common transformation. Change of air afforded relief from the attacks for a while, but as soon as she had been a short time in any place in England they began to return. She enjoyed a more complete immunity when at sea or abroad, and during two or three journeys to the Orkneys, and in one to Malta, Egypt, and other parts of

the Mediterranean, and for some time after her return, she had not a single attack. In November 1872, however, she was suffering more than ever: she scarcely had a day free from pain, and twice a week, or even more frequently, was prostrated by a severe attack. These began with pain in the brow, extending over the side of the head, and then shooting into every limb. Usually there was violent retching, but not always. After the violent pain she was left in a state of extreme prostration, almost amounting to insensibility, which lasted for the remainder of the day.

A complication had been gradually coming on, which she called indigestion. There was some gastralgia, but what she most complained of was, that on beginning to eat she lost all power of attending to what was said or done, and became unable to take part in, or even to follow, the simplest conversation. This was worse at lunch than at dinner, and had become so bad that she was compelled to withdraw from all society at this meal, eat it alone, and then lie down; she was beginning to be afraid also of dining with friends. The neuralgia had been treated in various ways, but for some little time she had been allowed to diminish the quantity of food on account of the dyspepsia, and she had taken carbonate of potash for the relief of discomfort attributed to acidity. I attributed the mental confusion at meals to cerebral anæmia, caused by diversion of blood to the gastric mucous membrane for the work of digestion, and explained the lesser degree of this at dinner than at lunch by the fact that the food taken at the earlier meal had become available for the support of the nervous system at the later.

Of course it was necessary here to do more than give drugs. I ordered breakfast to be taken in bed, and to be followed by some repose; at 11 or 11.30 a.m. a cup of strong beef-tea; the luncheon to consist chiefly of meat, with Burgundy or porter; milk with cocoa to be taken instead of afternoon tea. Dinner needed no special regulations. A little beef-tea was to be taken at night. The phosphorus was ordered to be taken twice a day with a teaspoonful of cod-liver oil, after lunch and dinner.

Four days after the commencement of this treatment the patient was entirely free from pain, and so remained for three weeks, when, according to my directions, the phosphorus was to be suspended for a week. She was at this time entertaining a large party at her husband's country house, giving dinner and ball. In three or four days she began to have neuralgic twinges, upon which she at once resumed the phosphorus, which she still takes with occasional intermissions. She has had no attack now for more than three months, which is

unprecedented in her experience, and she is better in all respects.

2. *Nervous Break-down from over-work, &c.*—Another case, of a different character, is that of a gentleman aged about 35, a merchant. He lives a short distance out of town, going into the City daily. Unfortunately several unfavourable hygienic conditions are concentrated round his residence. The soil is clay; the house is near the foot of a hill, and on the wrong aspect, so that in winter it is reached by the sun for a few hours only on the finest day. It will be easily understood that a winter such as that through which we have just passed, which has been remarkable for long-continued prevalence of wet weather, was especially trying in a situation naturally damp. Near the end of November one of my patient's children had typhoid fever, which gave him much anxiety and caused him loss of rest; it robbed him also of fresh air and exercise, and kept him much in the house. Under this he broke down; his sleep had for some time not been very good, and he now lay awake almost the whole night. He was often giddy, had severe pain in the head, and the top of the head was always hot; he frequently had palpitation of the heart, tightness of the chest, and a sense of impending syncope; felt destitute of energy, and unable to give his attention to anything, the least effort in this direction giving rise to a painfulness in the head, and throbbing sensations. He often felt feverish in the night, and perspired rather freely towards morning; but the temperature, which was carefully taken by the patient at various times, was never above the normal standard. The appetite was not good, but he was able to take a fair amount of food; the tongue was furred; the bowels rather confined. Pulse soft, compressible, and quick or sharp. Pupils very large.

The symptoms were those of nervous depression, and were such as often accompany, in a greater or less degree, atonic dyspepsia, and what we are accustomed to regard as derangement of the liver. Dyspepsia and its discomforts were, however, not prominent. I first prescribed an aperient and quinine, which was pushed to doses of six grains. It was necessary to procure sleep, and for this purpose chloral was given, but with very inconstant effect, and occasionally an opiate was required. Iron was shortly added to the quinine, and for a time small doses of pil. hydrarg. and ext. colchici, with pil. rhæi co. and ext. taraxaci, were given at night. He was a little better for this treatment. I attached most importance, however, to change of air, and sent my patient and his child to Hastings for a fortnight. He soon began to enjoy better rest, but, though much benefited, did not derive all the

good I had expected from his visit. This was partly due to an unfortunate chapter of accidents. He was kept awake one or two nights by storms; was alarmed by an attack of vomiting and diarrhœa, with high temperature, which was induced in his little boy by an imprudence in food; and on another occasion he over-exerted himself and brought on an attack of palpitation, by hurrying to escape a shower. On his return he attempted to resume his work, but notwithstanding great care and shorter hours of business, he began at once to suffer from his old symptoms—headache, oppression, low spirits, want of energy, palpitation, &c. I was particularly struck with the character of the pulse, which was that of extreme arterial relaxation, the pulse-wave being sudden and short, the artery in the interval perfectly flaccid. I now gave strychnine and iron, and as I considered that the want of vascular tone was not only an indication of nervous weakness, but in itself a source of mischief, I added ʒ ij of infusion of digitalis for the purpose of inducing contraction of the muscular walls of the arteries. He was better, and was able to go to his office, but had frequent headaches, remained entirely destitute of energy, slept badly, and on any excitement had a return of his old symptoms in full violence. Both his friends and he himself were becoming alarmed, and it seemed as if nothing short of a prolonged absence from business, which would have involved serious sacrifices, would restore him to health. I now began to give the phosphorus capsules, at first one, then two per diem, after meals: this was on January 18. From this time he gradually improved, and when he reported himself on March 3, said that for a fortnight or three weeks he had felt all his usual energy, and had ventured to put himself in the hands of his dentist, which had cost him two or three nights' rest. He had not, however, altogether recovered his usual healthy appearance. On March 17 he was still better, both as to strength, energy, and looks, notwithstanding unusually trying circumstances.

I have now under my care a lady suffering from atonic dyspepsia, with low spirits and apprehensions of all kinds. When I first saw her she indulged in a fit of weeping before she could tell me what was the matter with her. Here I gave, in addition to the strychnine and acid, which I find most useful in such cases, a phosphorus capsule once a day, and the improvement has been much more rapid than is generally seen.

I have also given phosphorus with obvious advantage in cases of syphilitic disease of the brain giving rise to epilepsy, after a course of iodide of potassium in large doses; this remedy often leaving the nervous centres in a weakened condition.

I do not pretend to explain the action of phosphorus. The popular *rationale* is, that as phosphorus is found in the nervous structures, the beneficial effect is produced by supplying this element for their nutrition. We might with equal reason try to live on charcoal because carbon is a constituent of the tissues and its oxidation a source of heat. The influence of phosphorus and arsenic on the nervous system is analogous to their influence on the nutrition of the skin, which is seen not only in the case of cutaneous skin diseases, but in the production of zoster by arsenic. Carried further, the same action produces the granular change in the muscular and glandular structures seen in cases of poisoning by these substances.

It has often occurred to me to hear it proposed to give phosphorus in the form of phosphoric acid. The absurdity of this will be seen, if we substitute sulphur for phosphorus, and speak of using sulphur and sulphuric acid indifferently.—*Practitioner, April* 1873, *p.* 230.

19.—THE HYPODERMIC INJECTION OF STRYCHNIA IN PARALYSIS.

By Dr. William Carter, Physician to the Liverpool Royal Southern Hospital.

Among the methods of treating local paralyses, that by the hypodermic injection of strychnia deserves careful attention. In the following case, there was at first general paralysis, with greater loss of power in one part, however, than elsewhere; and this part continued paralysed after the rest of the body had regained much of its normal strength. It may to some extent, therefore, be considered a local paralysis; and the effect produced on it by the hypodermic injection of a concentrated solution of strychnia was very satisfactory.

S. D., æt. 37, was admitted to the Southern Hospital, under my care, on Dec. 17th, 1871, suffering from general paralysis. Thirteen weeks previously, she had been confined of her eighth child. Everything went on well, till at the end of the third week, when she walked out. During this walk, which was in the evening, she got wet, and on the next morning was suffering from pains in the back of the neck, and so much dorsal stiffness as to render her unable to stoop. She applied turpentine to her neck, which became better; but during the next three weeks she found that day by day she was losing power in her limbs; and the weakness became at length so extreme, as to render her incapable of any exertion, and to compel her to come into hospital.

When admitted, she had the appearance of a healthy, well-nourished woman, but was suffering from all but complete loss of power in all her limbs. Though all the extremities were paralysed, the left arm and hand were certainly the most helpless. She could just manage to move the legs, and to raise the right arm slightly from off the bed; but the left one lay perfectly motionless, with the hand in a prone position; and she was unable, by any effort of will, either to raise it in the slightest degree, or to effect the least amount of supination. There was a little, if any, loss of sensation. The diaphragm and intercostal muscles acted well in respiration. On examining the spine, there was found to be a great deal of thickening at the lower part of the neck, which she said had only been present since the commencement of her illness. There was no tenderness anywhere on percussion, nor was any pain caused by passing a hot sponge down the spine. Heart and lungs healthy. Pulse 90. Bowels constipated; urine scanty. One drachm of Easton's syrup of the phosphates in water was ordered three times a day; and, as the usual house medicine produced no action of the bowels, a powder was given, containing five grains of calomel and fifteen of jalap, which had to be repeated again and again at intervals during the first few weeks of treatment. The left arm was also ordered to be galvanised by means of the induced current for ten minutes twice a day.

Dec. 22. The note for the day describes her as being "much better; more motions in the arms and fingers; tips very sore. Complains of twitching on falling asleep, in consequence of which she is sometimes unable to sleep."

On Dec. 29th, as the left upper extremity continued very helpless, the nail of the fourth finger on either side was stained with nitric acid, with a view of ascertaining from the relative rapidity of their growths whether the nutrition to the matrices was equal.

On Jan. 3rd, 1872, there was a clear interspace at the lowest part of the right nail, which by Jan. 5th, had increased a good deal; the nail of the left hand not presenting the least evidence of growth.

On Jan. 12th, she is said to be "very much better; walked twelve steps alone; was up for an hour and a half; the left arm still very helpless; supination impossible on the left side; easily effected on the right; sensation complete on both sides." As the left arm continued so helpless, one twenty-fifth grain of strychnia in solution was on this day injected into it, the mixture being continued as usual. This produced no apparent effect.

On Jan. 17th, therefore, double the quantity was injected over the outer condyle of the humerus, near to the point of

division of the musculo-spiral nerve, into its radial and posterior interosseous branches.

On the following day, she is said to have had some slight power of supination; and the bowels, which had ever since her admission been obstinately constipated, are said to be acting regularly.

On Jan. 22nd, the injection was repeated.

The power of supination was increased on Jan. 24th, on which day a further injection—this time of one-tenth grain—was made.

This was repeated on Jan. 28th.

On Jan, 31st, the bowels are said to have acted daily for a good many days past without the use of purgative medicines.

No inconvenience having been experienced from the injection of one tenth of a grain, the amount was still further increased, on the 5th of Feb., to three twenty-fifths of a grain. Slight cramp of the legs followed this.

It was, however, repeated on Feb. 7th, without being followed by cramp; and again on the 12th and 16th, on which last day its employment was discontinued, the condition of the arm all the time rapidly improving.

By the middle of March, she could walk four or five times along the corridor without assistance; and having continued steadily to improve, she was, on the 24th of April dismissed.

At the time of her discharge, the following note was taken:—"The left deltoid a good deal less than the right; the left arm can be abducted a foot from the side; supination can be performed readily, and everything grasped between the fingers, though there is slight numbness in these. The hand can be raised as high as the nose. The power of using the right arm is perfect, though there is slight numbness in all the fingers. She can walk well. There is some pain over the last cervical vertebra. The thickening at the lower part of the neck posteriorly is undiminished."

In the second volume of the Trans. of the Clinical Society of London, some interesting cases are detailed, by Mr. Barwell, of local paralyses in children benefited or cured by the hypodermic injection of large doses of a concentrated solution of strychnine. Mr. Barwell thinks that, when a concentrated solution is hypodermically injected, the effects are more local than when it is more diluted; and that, consequently, what would at first sight appear to be dangerous doses may be thus administered without the system generally being injuriously affected.—*Liverpool and Manchester Medical and Surgical Reports*, 1873, *p.* 38.

20.—ON THE HYPODERMIC USE OF STRYCHNIA.

By Dr. J. J. Chisolm, of Baltimore.

Dr. Chisolm states that he is in the daily habit of using strychnia by hypodermic injection in nervous affections of the eye, and although the results are not always strikingly beneficial, in no case have they been injurious. He has found that by increasing daily the quantity injected, a much larger amount than is mentioned in books may be administered with good results. He formerly commenced with the one-sixtieth of a grain, and slowly increased the dose to one-thirtieth, but he now usually commences with one-fortieth of a grain. The strength of the solution he uses is 4 grains of sulphate of strychnia to one ounce of distilled water, each minim containing the $\frac{1}{120}$th of a grain of the alkaloid. He usually commences the strychnia treatment by injecting three minims of the solution, equal to one-fortieth of a grain. If no marked symptoms of poisoning ensue, he increases the amount of the solution every day by one minim, until a maximum dose is reached, which is frequently one-sixth, and often one-fifth of a grain. In one case, one-fourth of a grain of sulphate of strychnia was injected at a dose, and continued daily, without causing any special annoyance. In some cases Dr. Chisolm has found that good results are not attained until large doses are reached. When the dose of strychnia has attained its maximum, that is to say, as much as can be comfortably borne, it should be steadily persevered in at this strength as long as any improvement shows itself. He states that he has continued the injection of one-sixth of a grain doses for three months, but he gives a warning that, as with all potent medicines, cases will now and then be met with in which even the commencing dose of one-fortieth of a grain will prove too powerful, and he has heard of a case of marked idiosyncrasy, in which one-fiftieth of a grain of strychnia, used hypodermically, caused convulsions and insensibility, which lasted several hours. He himself had a case in which, the patient being a young lady of nervous temperament, an attack of convulsions of short duration was brought on by the use of one-twentieth of a grain. The place where the injection is practised is of no great importance, and in the cure of eye and ear diseases there is no advantage in injecting the solution near the affected organ, as the remedy acts only on the nerves of sight and hearing through the instrumentality of the nerve-centres and by means of the circulation. The most convenient place, according to Dr. Chisolm's experience, is the loose skin near the outer surface of the shoulder, or in the outer and upper third of the arm. Care should be taken not to inject more than the quantity required,

and accidents may be prevented by not putting into a syringe more than the medicinal dose. The cases in which Dr. Chisolm has found the hypodermic use of strychnia most serviceable are hemeralopia, muscular asthenopia from overwork, amblyopia, and tobacco amaurosis.—*Med. Chirurg. Rev., April* 1873, *p.* 499.

21.—ON THE THERAPEUTICAL USES OF GALVANISM.

By Dr. Samuel Wilks, F.R.S., Physician to Guy's Hospital.

It must be generally admitted that the therapeutical uses of galvanism have received a fresh impulse since the introduction of the continuous current into practice. Until a few years ago the only method in use, except frictional electricity, was that of faradization. This was sometimes beneficial, but as often quite valueless, so that galvanism was either indiscriminately recommended in all forms of paralysis, or was systematically neglected. A very different feeling, however, prevails at the present time, for we are beginning to discern in what cases faradization is useful, and in what cases it fails; more particularly has it been noticed that it is in those very cases where faradization has been useless that the continuous battery current has been so fruitful of results. We some years ago introduced into our electrifying room a large battery in which any number of cells up to 100 could be combined, and with this instrument we have witnessed a success in many cases which scarcely could have been anticipated. We have a large number of patients daily being operated upon, and two or three attendants constantly employed either in the room or in the wards. It has not yet been satisfactorily determined why one form of galvanism should fail to stimulate a muscle and be useless as a remedy, whilst another form excites it to contraction and is curative. This may be dependent upon the condition of the muscle or of the nerve which supplies it, or the centre whence the nerve springs; at the present time the facts themselves are not sufficiently established, but when they are so we shall be able to use them as a means of diagnosis. All I shall attempt to do here will be to state some of the facts we have observed, and thus offer a small contribution towards the material out of which some more important conclusions may be eventually framed.

In the first place, we had no sooner possessed our battery than we discovered its marked value in cases of simple paralysis of the limb. In these cases faradization often fails to produce the slightest effect, whereas the application of the continuous current immediately excites the muscles to contraction, and eventually brings about a cure. A good case of the kind I give

below. Then, again, in various forms of paraplegia, its good effects have been most striking. As I have before said, it is most difficult to ascertain, in various forms of paralysis, whether an organic disease of the cord exists or not, seeing that all the symptoms which attend it may occur in the case which is functional and curable, and therefore it is true that galvanism has been used in many cases and failed; but, on the other hand, we have had a variety of cases which may be included under the term paraplegia, where a complete cure has been effected by applying the current to the back. In some cases of locomotor ataxy I have witnessed perfect recovery, both in hospital and private practice; also in cases of commencing progressive muscular atrophy. In paralysis agitans I never saw much good done by faradization or any other remedy, but in a case I mention below it appeared as if much benefit might accrue from the use of a continuous galvanic current down the spine. In no case is the effect of the continuous current to the limb so remarkable as in the atrophic paralysis from lead, two examples of which I shall presently relate. The fact has now for some time been observed that the muscles in this affection are not susceptible to the interrupted current or faradization—that a painful amount of it may be used, and yet there shall be no response on the part of the muscle. I have had several cases in the hospital which completely establishes the fact. On the other hand, if the continuous battery current is used, even in a mild degree, excitation immediately occurs; that is, when the current is completed and again broken.

In the very first case on which I experimented some years ago we found in the case of a young man suffering from lead paralysis, that whereas no irritation of muscle could be displayed by the magneto-electric machine, immediate contraction took place on the application of fifteen cells of the battery—an amount which produced a scarcely perceptible effect on the arm of a healthy student.

It is observed that as the cure progresses so the susceptibility to the continuous current becomes less, and that to faradization greater, until, as in the healthy subject, both forms cause contraction of the muscles. The case of lead is very striking, because there are kinds of paralysis in which the two forms of galvanism act in the opposite manner; thus, lying in a bed near that of our patient, who was the victim of lead poisoning, was a girl suffering from old-standing spinal paraplegia; in her case the continuous current produced not the slightest effect in stimulating the muscles of the leg, whilst faradization produced strong and painful contractions of the muscles. The same occurred in a man who had long been bedridden with an incurable paraplegia. It has been thought that faradization

acts directly upon the muscle to stimulate it, whilst the continuous current acts through the nerve. This has by no means been proved, but if it had it might be used as an argument that in lead poisoning it is the muscular rather than the nervous system which is affected by the metal. Such an opinion, however, is not borne out by experience, seeing that the whole cerebro-spinal centres may become atrophied in plumbism, as evidenced by epilepsy, general paralysis, or dementia. The atrophy resulting from lead differs from that which is called idiopathic in this respect, that although in the two cases no difference is observable in the form of wasting, yet in the latter there is very little susceptibility to either form of galvanism. It has been suggested by Dr. Russell Reynolds that there is no essential difference between the primary and the induced current, but that the simple interruption in the one case is sufficient to account for its peculiar effect—that muscles under abnormal conditions may not be able to take cognizance of a simple current passing through them, whereas they would if it were broken. If this were so, the primary battery current, if interrupted, should produce the same effect as the ordinary induced current or faradization. In one or two cases where the experiment was tried, the result did not verify the suggestion. Where, for instance, one pole was placed just below the elbow, and the other pole stroked down the arm, a contraction took place when it was lifted from the limb or again replaced. The current was then interrupted by a wheel, but exactly the same phenomena occurred, contraction on making and breaking contact, but none whatever as the sponge was stroked down the arm. With faradization, on the contrary, violent contraction took place. In this case, therefore, the difference between the two forms, even when both were made to intermit, seemed well marked. Further observations, however, are required before I could give a decision on this matter, either for or against the suggestion of Dr. R. Reynolds.

I have already spoken of the intractability of cases of spasm and contraction of the muscles. In many cases organic disease of the spinal cord and nerves exists, and, therefore, no result could be expected; but even in others, as in wryneck, where an immediate effect of galvanism was witnessed, no permanent good resulted from its use. Even in cases of so-called hysterical contraction of the arm I have been much disappointed at the failure of galvanism.

The effects on the muscles in the cases of spasmodic contraction is seen in the reports, in which it appears that they are more susceptible to faradization than to the continuous current.

One must not forget to mention the soothing effect of gal-

vanism. In cases where neuralgic pains have existed, patients have expressed themselves as much relieved by its application, and have often slept better afterwards.

The public is so much impressed with the value of electric baths that I proposed to try it in a case of lead poisoning. I am aware that others have pronounced it to be valueless, which, in all probability, is the case, there being no proof that the galvanic current passes anywhere but over the surface of the body. In my case the speedy success was so remarkable as to throw strong suspicion on its having had any value at all.

I give the case below with the mode of use. Usually, I believe, the plan has been to place the patient on an isolated stool in the water, with one pole in his hand, the other being attached to the bath. In the present case Mr. Sandy used a different method.

Case 1.—*Paralysis of Leg.*—George W., æt. 36, admitted into Stephen Ward June 19th, for weakness of the left leg, and left July 23rd. This man was the subject of a remarkable enlargement of the veins on the surface of the abdomen, indicating some obstruction to the vena cava. He had observed this fourteen years, but it had given him no inconvenience nor interfered with his employment.

Patient stated that in March last he was seized with very acute pains through the left hip and groin, which gradually spread down the leg; and these pains were worse at night. Went to Swansea Hospital, where knee became contracted, and he took to crutches. He was then sent up to Guy's Hospital. He was put to bed, being quite unable to walk, on account of pains and weakness in the left leg. On examination, no local cause was discoverable for the symptoms; the leg was somewhat drawn up, it was perceptibly wasted, being smaller than the other, and sensation slightly impaired. On testing the limb the muscles were found to respond to both the faradic and galvanic currents. He was then ordered the continuous current to be applied daily to front and back of thigh. After the first application he expressed himself as having much relief from the pain, and in a few days it had altogether left him. At the same time the strength returned in the muscles, so that in a few days more he could walk. The current was still applied with a daily improvement in the strength of his leg, so that on July 10th he was walking about, and on the 21st he sufficiently recovered to be able to leave the hospital convalescent and nearly well. Patient took no medicine.

Case 2.—*Paralysis agitans.*—J. B., æt. 40, had been suffering for three years from paralysis agitans. The complaint commenced in the right hand, afterwards proceeded to the left, and then to the legs, until a general tremor of the whole body took

place, including the face, and affecting the speech. He had been under different kinds of treatment, but without any benefit. I wished to try the continuous galvanic current to the spine, and accordingly fifty cells (Cruikshank's) were used for ten days. After the second application the patient, who had previously had very restless nights, obtained refreshing sleep. After four or five applications he began to experience a decided benefit, saying he always felt lighter and steadier directly he had been operated upon. The duration of this improvement lengthened day by day. The patient then left for the country, and has not since been heard of.

Case 3.—*Lead paralysis.*—Mr. S., a gentleman of middle age, was brought to me, on March 11th, 1872, by Dr. Charlton, of Fareham, suffering from a most severe form of lead paralysis. His whole frame was attenuated in consequence of the atrophy which his muscular system had undergone; his limbs were very much wasted, and he was proportionately enfeebled. He tottered when he walked, his hands shook, and were so weak that he with difficulty could raise them to his head or button his coat. He resembled, indeed, the condition of a man with progressive muscular atrophy, only in this case it was induced by lead and was not idiopathic.

The history which he gave of his case was as follows:—He lived in Surrey, about twenty miles from London, and had enjoyed good health until June, 1871, when his arms and hands became tremulous, so that very shortly he was obliged to use both hands to raise fluids to his mouth to prevent spilling. He was recommended a change of air and took a trip to Scotland; after being there a month he got considerably better and returned home. In a fortnight all the symptoms reappeared more severe than before. He went away again to Southsea, and there used salt-water baths, when he a second time rapidly improved, and at the end of a month returned home. Shortly afterwards, however, the old symptoms reappeared, when he was advised to consult a London physician. He was ordered to use galvanism in the form (he stated) of magneto-electric shocks, which did not benefit him, when his doctor, suspecting lead, had his drinking water analysed and found it to be strongly impregnated by lead. He was then, of course, put on a proper course of medicine, desisted from the use of water, and he improved. He had continued the use of the galvanism. He subsequently left London and again went to Southsea.

When I saw him in March he had got into a stationary condition, and was in the state above described; his limbs wasted and with little power in them. I ordered him some small doses of iodide of potassium and quinine, and wished him to use a

simple galvanic current rather than electro-magnetism. Finding there would be a difficulty in making use of this at his own house, I advised him to go to Guy's Hospital every morning, and to this he readily assented.

Mr. Sandy, the electrician, tried the effects of the continuous battery current upon him, and also the induced current, with the following results. In the right arm the extensor muscles contracted well by the application of twenty cells of the Daniell's battery. The induced current was applied, as strong as the patient could bear, with scarcely any contraction. In the left arm the muscles contracted well by fifteen cells, and with precisely the same results on the right arm, with the induced or interrupted current. In the legs twenty cells caused good contraction, but scarcely any result was obtained by the interrupted current.

He continued the use of the galvanism to the limbs daily and made visible progress.

On April 18th he had considerably more power of the limbs than he had a month previously, and, on the muscles being tested, it was found that the 'induced' current which had been powerless before, now excited the extensor muscles of the right arm, so that the hand was raised on a level with the arm. On application of the same strength to the left arm it extended the fingers much more than the right, but the hand was not lifted to the same extent.

The patient peristed in the treatment up to July, during this period gradually improving, and in August he had quite recovered the use of his hands and was following his usual occupation.

Case 4.—*Lead paralysis.*—Margaret C., æt. 47, admitted February 29th, 1872. She has been married and has a large family. Two years ago her husband died, when she was obliged to work for her living. She gained employment in some lead mills, her business being to grind the white lead. For some months past she has been getting thin and feeble, her arms wasted, together with stiffness and pain in the shoulders. Has had slight colic.

On admission. She seems to be a small spare woman, anæmic and sallow, looking indeed extremely ill. She is thin, owing to a general wasting of the muscles of the whole body, more in the extremities and especially in the arms. She is too feeble to walk, and, therefore, obliged to keep her bed. She can scarcely raise her arms from her side, owing to the atrophy and weakness of the muscles; the extensor muscles of forearm are extremely wasted, rendering the arm quite flat, the wrists drop without there being the slightest power to raise them. Muscles of hand soft and flabby, the right arm and hand worse

than the left, so that she cannot use them for feeding herself. The blue line on the gums well marked, and a distinct blue stain along the lower lip corresponding to the stained border of the gums. Slight œdema of eyelids. Ordered ten grains of iodide of potassium three times a day. Tested by galvanism. Faradization:—As much power as the patient can bear has a very slight effect upon the extensors of the thumb and not upon the other muscles. Continuous battery current:—Good and well-marked contraction of all the extensors by twenty Daniell's cells. The continuous current ordered. Mr. Sandy finds the more efficient method to be by placing the fingers in water containing a little salt, the negative pole is placed in the water, and the positive pole gently stroked along the extensors. This causes contraction of the muscles and elevation of the wrist; when the poles are reversed the current and the effect are less.

April 17th. The continuous current has been used to the limb daily up to the present time, and the improvement has been marked though gradual. The blue line on the gums is much less. She is out of bed to-day for the first time. As the improvement has being going on, so the muscles have become susceptible to faradization, whereas they have required a larger amount of simple galvanism to affect them.

May 13th. Improved considerably; walks about. Is able to feed and dress herself. Can extend the wrist, and the arms are larger in bulk. Blue lines on gums and lips disappearing. On testing with faradization, there is marked contraction in the extensors, the hands being well lifted; this is more so in the left arm than the right, the right being always weaker and smaller.

In this case it may be remarked that besides a well-marked blue line along the edge of the lower gums there was a dark patch on the mucous membrane of the under lip, corresponding in position to that on the gums, but rather more defined and dotted. A question is always asked in the wards whether this mark on the lip is formed independently, or follows that on the gums from contact? The latter is the probable explanation.

In these cases of dropped wrist the back of the hand is often observed to be rounded, apparently from enlargement of the metacarpal bones, but due in all probability to some thickening of the thecæ.

Case 5.—Plumbism treated with electric bath.—Wm. J., æt. 36, admitted under Dr. Wilks, July 17th, and left July 27th. He began to work at grinding lead nine months ago, and at the

end of about five months commenced to feel ill, with loss of appetite, pains in his head and abdomen, and general debility. He continued at his work and daily grew worse, until a week ago, when he was obliged to desist, having pains in his limbs, sweating and inability to stand, and vomiting.

On admission: He was seen to be very pale and very thin, having evidently lost a great deal of flesh. Skin hot, tongue furred, marked blue lines on gums. Constipation. Recti abdominis contracted and painful.

July 20th. Ordered an electric bath. This was made by Mr. Sandy as follows:—the bath being prepared, enough sulphuric acid was put in it to give it a slight acid taste (about ℥iv), the negative pole of the battery, attached to a large sheet of copper about two and a half feet square, was put upright in the bath and the patient placed in it so as not to touch the copper plate; the hand of the patient was held out of the water and in it he held the positive pole. Fifty and eighty cells were tried, but when the current was applied to the neck instead of the hand the patient could not bear more more than fifty cells. On making and breaking contact the patient felt a kind of thud through the whole of the body. A bath lined with glazed tiles was used.

The patient used the bath again on the 24th and a third time on the 25th. He said he felt very cold after it. He always had his bowels relieved immediately after it. On each occasion he felt better, and on the 27th he was so much improved that he went out.—*Guy's Hospital Reports*, vol. xviii., 1873, *p.* 148.

22.—ON THE APPLICATION OF ELECTRICITY.

By the Editor of the Canada Lancet.

In Medical electricity there are two principal methods of applying the current, termed respectively, general and localized electrisation, with either the galvanic or faradic currents.

The object of general electrisation is to bring the whole of the tissues and organs of the body under the influence of the electric current. This is usually done by placing the patient upon a metallic plate to which the negative pole is attached, while the positive pole is applied to the surface of the body. For this purpose the faradic or secondary current is the one usually employed; but the galvanic may sometimes be used with advantage, especially where the patient is not very sus-

ceptible to ordinary stimulation. For the application of the faradic current to the general surface, the operator's hand is preferable to the ordinary sponge electrode, especially when operating about sensitive parts, as the head and neck; no artificial electrode equals the human hand in flexibility and adaptation to the inequalities of the surface of the body, and excessively sensitive persons will bear this mode of application who could not tolerate it in any other way. Electricity is not a mere stimulant, the effects of which soon pass away, but it possesses tonic properties of the highest value in the treatment of various disorders.

In the treatment of various nervous and functional diseases in which excessive debility is the principal symptom, the tonic influence of general electrisation is most decidedly manifest. It is exceedingly useful in all cases of exhaustion uncomplicated with organic disease.

Localized electrisation has reference to the application of a current of electricity to special nerves, muscles, and organs of the body, and a variety of electrodes of different shapes and sizes for localized electrisation are adapted to the parts to which it is applied. The limits of the present article will not admit of our entering fully into the details of its application to all the various parts of the body to which it may be applied; but we will indicate a few. In applying it to the head one pole may be placed upon the forehead, and the other over the occiput; or a pole may be placed on either mastoid process or on either temple. Less dizziness is caused when the current passes from the forehead to the occiput than when it passes from side to side. Galvanisation of the sympathetic may be readily effected in the cervical region by applying one of the electrodes over the sixth cervical vertebra, and the other in the auriculo-maxillary fossa. It is, however, impossible to exclusively localise the current in the great sympathetic; the spinal cord is also affected in the above method. The spine may be galvanized by applying one pole a little below the occiput, and the other at the coccyx, or by placing an electrode on either side of the spine, one above the other, about two inches apart. Cutaneous faradisation is accomplished by thoroughly drying the skin and applying the current by means of dry metallic electrodes, or by the hand. This method has been found extremely useful in conditions of profound cutaneous anæsthesia. The electric moxa is produced by applying rapidly to one part a dry and finely pointed electrode. It is frequently employed as a counter-irritant in obstinate cases of neuralgia.—*Canada Lancet.—Med. Press and Circular, Dec.* 11, 1872, *p.* 514.

23.—ON THE INFLUENCE OF THE CONTINUOUS GALVANIC CURRENT OVER VOLUNTARY MUSCULAR ACTION.

By Dr. G. V. Poore, Assistant Physician to Charing Cross Hospital.

In the number of the Practitioner for September last will be found a paper by the writer on a case of "Writer's Cramp and general Spasm of the Right Arm," which, though of nine years' standing, was successfully treated by the joint use of the continuous galvanic current, and the rhythmical exercise of the affected muscles. For the benefit of those who may not have read that paper, I may be allowed to say that the method of treatment was as follows:—A continuous current was passed through a single muscle (such as the deltoid) or a group of muscles (such as the flexors of the wrist and hand); and while the muscles were under the influence of the current, the patient was ordered to exercise them voluntarily. This method of treatment was followed by the best results—results which were surprising to myself and my medical friends.

At that time I offered no explanation as to why this method of employing galvanism proved so serviceable. I was inclined to regard the galvanism as of use merely in overcoming muscular spasm, and attributed to the rhythmical exercises most of the permanent improvement which took place. Since then I have had further experience of this method of employing galvanism, and have obtained some insight into the *modus operandi* of the continuous current when thus employed.

One of the usually prominent symptoms in writer's cramp or palsy is a feeling (more or less intense and more or less unbearable) of fatigue along the muscles of the arm. This may be limited to the fore-arm, or may extend from the shoulder to the tips of the fingers. I have found that this feeling of fatigue is at once removed by the application of the continuous galvanic current either along the course of the nerves or muscles of the arm. One patient, who has suffered very acutely from this feeling of fatigue, has always expressed great satisfaction during the employment of the current, and has frequently used the words "comfortable" and "pleasant" to express his sensations. He has also often said, "*That seems to give me strength, to give me a sense of power in the arm.*" This patient also had a difficulty in supinating the hand of the right arm. There was no true paralysis, and no visible wasting of any of the muscles (though the whole of the arm and fore-arm was notably flabby, and remarkably non-muscular); but the act of supination was a laboured act, and the patient soon tired of performing it.

On telling him to alternately pronate and supinate the hand,

these acts were accomplished tolerably well for the first four times, then the act of supination became slow, and was accomplished with an evident effort, and after four or five more attempts it became impossible; and this, as far as one could see, was not due to any spasm of antagonising muscles. When the supination came to a standstill, I placed the positive sponge-holder of my battery as near as possible over the spot where the musculo-spiral nerve turns forward at the outer part of the elbow-joint, and the negative on the spot where the radial nerve becomes superficial on the radial border of the fore-arm. The number of elements employed was sufficient to cause an appreciable but not painful sensation to the patient. This seemed to help the supinators over their difficulty, and the patient continued to pronate and supinate his hand without the least trouble, telling me at the time that "he could do it much easier when I passed the current," and also "*that it seemed to give him strength.*" Other muscular exercises were practised with this patient, such as repeated flexings and extendings of the fingers or of the thumb alone, and he always said that the movements were accomplished more easily, and he got less readily fatigued when a galvanic current was passed through the muscles implicated, or along the nerve supplying them. "It seems," he said, "to give me strength and power." One is not inclined, at least I am not, to pay much attention to the sensations and expressions of a patient; and although my patient was an intelligent man, I thought nothing of what he said until I found another (also suffering from writer's cramp) who said precisely the same thing, "that he could accomplish repeated muscular acts with far greater ease during the passing of a current, and that after the employment of the current he had a feeling of strength and power in the arm." This latter patient's expressions demanded attention, for he was a medical man, and himself accustomed to the employment of electricity. This gentleman suffered acutely from the miserable feeling of fatigue in his arm; and though his muscles are big, and he is decidedly athletic, he soon tires of repeated exercises. This tiring of the muscles and the feeling of fatigue were both obviated by the employment of the current.

From these disjointed observations I got the idea that the passage of the continuous current through muscles, or the nerves supplying them, increases the susceptibility of those muscles to the stimulus of the will, and that their voluntary power is thereby greatly increased.

I proceeded to submit this notion to the test of experiment, and nearly every experiment I have made goes to prove the correctness of my theory.

The first experiment was made upon the patient (H. M.) first mentioned in this paper. I asked him to hold his left arm at right angles to his body, and in the palm of the hand I placed a weight of seventeen ounces. "Now," said I, "tell me when you begin to feel tired, and that you can go on no longer." In about four minutes (the experiment was only tentative and not exact) he complained of great pain in his muscles—deltoid, triceps, biceps, and fore-arm—and declared his inability to go on. I then placed the positive rheophore high up in the axilla, and applied the negative one to the painful parts, when he at once said, "All the fatigue is gone, and I feel as strong as when I began." On the evening of the same day a scientific friend kindly submitted himself to a similar experiment, and the result was the same. When the sponges were applied, he said, "All the fatigue is gone; I feel just as though some one had given my hand a support." I need hardly say that great care was taken not in any way to support the limb with the rheophores; in fact in these experiments one of the rheophores at all events has generally been as an additional burden to the arm. The current employed has hardly ever been strong enough to produce involuntary contraction of the muscles. My next experiment was made on a student of medicine, Mr. L. S. The result was exactly similar. At the end of seventy seconds he began to make complaints of pain and fatigue, which the current at once removed, and he continued to support the weight for five minutes and a quarter, declaring at the end that if I wished he could still go on, which I would not allow. This was the right hand. We then tried the left hand, without employing any current at all. He broke down in considerable pain after holding the weight for two minutes and a quarter. In the evening of the same day he stated that his left hand had been aching all day, but that the right had not given him any trouble. Two days later we tried the right arm again, but without using the current. He managed with the greatest difficulty to support the weight for three minutes and ten seconds, and the effort was followed by considerable aching and pain. On December 6th I asked my patient H. M. to hold the weight in his left hand, and on this occasion no electricity was used. He is a man whose power of endurance is very great, and he managed to sustain the weight for *six minutes*, but endured considerable pain and fatigue while doing so. On December 7th I first galvanised the arm, and then got him to repeat the experiment, and while the experiment was in progress I occasionally passed a current down the arm and through those muscles in which any sense of fatigue or pain was developed. On this occasion he managed to sustain the weight *for thirteen minutes and a half*, a time

which I should think few, if any, men could accomplish without aid.

Similar experiments to these have been tried on several of my friends, and they all tend to show that the endurance of voluntary muscular action is enormously increased by the passage of a continuous current, and that the feeling of fatigue, both during and after the prolonged effort, is mitigated or entirely obviated. It may be that the first result is merely a consequence of the second.

Experiments have also been made, and with results which tend to show that the force, as well as the endurance, of voluntary muscular action is increased by employing a galvanic current. The muscles experimented upon have been the flexors of the fingers, the contracting force of the muscles being registered by the squeezing of a spring dynamometer held in the hand.

The majority of my experiments, typical samples of which I have alone given, tend with greater or less force to show that the force and endurance of voluntary muscular action are both increased by the passing of a galvanic current through the nerves or muscles implicated; but as I have above stated, it is exceedingly difficult to get constant results with the spring dynamometer, and although my experiments with this instrument all tend one way, I do not regard the results as final.

The therapeutic importance of this fact is, I think, considerable, and is likely to lead to the combined use of electricity and voluntary movements in many diseases where there is only partial impairment of muscular power. The case which I published in September is only a solitary example of the benefits of this method of treatment, and is consequently of little value. I may mention, however, that I have two similar cases now under my care which are being treated in the same way, and are making rapid progress. It seems to me better in all cases where it is possible to let a muscle react to its proper stimulus the will, than to employ for the purpose of causing muscular contraction a stimulus which is wholly artificial. I should mention that the effect of the galvanic current seems to endure for some time after its discontinuance: how long we cannot say; but my patients, if this is worth anything, tell me that their arms retain the feeling of power and strength for about an hour. I am hoping to be able to make further experiments on the effect of a galvanic current upon common sensation.—*Practitioner, Jan.* 7, 1873, *p.* 37.

24.—CASES ILLLUSTRATING THE EMPLOYMENT OF CENTRAL GALVANISATION IN VARIOUS SENSORY DISTURBANCES.

By Dr. Thomas Buzzard, Physician to the National Hospital for the Paralysed and Epileptic.

The influence of the constant galvanic current in relieving pain, and often permanently arresting it, in the district of a single nerve or the distribution of a plexus, is by this time well established, although the conditions which affect its success or failure must be allowed to be still undetermined. I have been trying central galvanisation lately in a number of anomalous conditions of the sensory organs, as well as in cases of well-marked neuralgia, with a varying result. Out of these cases I propose to cull a few which appear the most interesting, or about which I am in a position to give the most accurate information.

Case 1.—A man, aged 68, had suffered for one year from pain, limited to the region of the two upper divisions of the fifth nerve, left side. The pain was constant, but terribly increased besides by movement in walking, or even driving, or by a current of air. There was also such intense hyperæsthesia of the skin that he could bear nothing to touch this side of his face, which was consequently left unwashed and very dirty. He could not even bear the bed-clothes upon it.

The constant current from five cells Daniell-Muirhead—the negative pole to the painful region, and the positive to the nape of neck—was applied once during three minutes. He was then from circumstances unable to attend the hospital for three months, when he appeared again, still suffering as described. The current was now applied regularly twice a day in the manner just noted, with a gradual improvement. After six weeks the pain had ceased to be constant, although it still attacked him at intervals, but the hyperæsthesia of the skin was entirely cured. I could touch roughly any part of the affected region.

I would just add here, that although I have not found any marked benefit from galvanism in ordinary toothache, yet for the scarcely less wearisome aching which remains, often for hours, after the extraction of a tooth, the constant current is of extraordinary value. It will generally stop this effectually at once.

Case 2.—A single woman, aged 42, who had been epileptic from 17 to 35 years of age, applied with violent pain in both parietal regions, occasional loss of memory, and fears about retaining her reason. There was a history of struma in early life, and later a good deal of mental trouble. K Br was useful

at first, and then failed to relieve her, as did opiates and chloride of ammonium. The pain was intense, coupled with vertigo, tinnitus aurium, flushing of face, besides occasional stammering and subjective sensation of "people talking." She then had the constant current from eight cells Stöhrer through the temples, and also with the positive pole on the neck, the negative on the painful part, two minutes in each direction.

During the application the pain left her. Three times in each week this treatment, without drugs, was continued for six weeks. Sometimes the pain would return as soon as she had quitted the electrical room, at others it would leave her for a few hours. On the whole, however, she improved: her memory was clearer, she lost some of her discomforts, and became more cheerful. But this did not last, and at the end of this time it was pretty evident that she was in very much the same state as at first. I therefore stopped the galvanism and gave her arsenic, which immediately relieved her much more than anything which had been done.

These were cases of neuralgia.

Case 7.—A single woman, aged 29, had suffered at the time of her application at the hospital, for two and a half years, from severe pain in the head, as often on one side as on the other. Her appearance was striking from the hair of her head being throughout completely grey, the change in colour having commenced when she was seventeen years of age. She had, as might have been expected, a neurotic family history, which is worth giving in detail. One of her sisters, it seems, turned grey at twenty-one, and died at forty-seven of "epilepsy." Another sister died between thirty and forty years of age of consumption, and "*her* mouth," the patient said, "was drawn to one side." A third sister is still living, thirty-four years of age, and not at all grey. Six of her brothers died in childhood—one suddenly at seven years of age, one soon after birth, and the others either of zymotic diseases or from some cause which she could not remember. Her mother, still living, seventy-six years of age, suffered during the last two winters from neuralgia. Her father died of dropsy, after rheumatic gout and drinking.

She herself was in good health till four or five years ago, when she became subject to violent headache, which for the last two and a half years had never entirely left her.

The occipito-parietal region of the head was indicated as the chief seat of the pain, which attacked sometimes one side and sometimes the other, and the corresponding arm was described as feeling numb and wanting power during the exacerbations. Digital pressure upon the occipital bone and in the neigh-

bourhood of each parietal eminence made her flinch very much. There was nothing in her other organs to call for remark.

Chloride of ammonium, iron, and quinine were severally administered without good result, but were often vomited. Chloroform and belladonna were also applied locally without relief. For three weeks she was injected subcutaneously with morphia ($\frac{1}{6}$ grain), and with considerable temporary relief, the effect lasting more or less for twenty-four hours. The injection made her quite stupid for several hours, and she slept well during the night following, her ordinary habit being to be woke up repeatedly by the pain. Altogether, she said, she had never been so easy as under this treatment.

The constant current, derived from twenty to twenty-five cells of Daniell-Muirhead battery, was then employed, the positive rheophore being applied to the nape of the neck, and the negative to the tender points in turn, the application to each lasting two minutes. Then a rheophore being placed on each temple, a current of like strength was passed for two minutes. This treatment was continued three times a week for three weeks. The patient reported that during the application of the current she entirely ceased to feel the pain, and that generally for two or three hours afterwards there was considerable ease. The alleviation, however, did not last nearly so long as that produced by the morphia injection. A trial was then made of a proceeding which is termed galvanization of the sympathetic. One of the rheophores (a small metallic dish covered with wetted leather) was held firmly in the right auriculo-maxillary fossa, and the other applied to the side of the lower cervical vertebræ, and a current from fifteen cells of Daniell-Muirhead battery allowed to pass during five minutes. This treatment has now been continued for ten weeks, the current being thus applied from three to six times a week. She says that during its application she feels very bad, and as if she were going to die, the sensation being very much worse than that produced by the other electrical treatment. The giddiness persists for half an hour, but there is no faintness. The resulting ease, however, lasts far longer than that which followed the former process, often continuing until the next day. At times she has been a good deal better, and altogether it is certain that she has not had such violent attacks as formerly. On the other hand, she cannot think the relief is permanent, for if she goes a little longer than usual without the treatment the pain becomes severe. I have now ordered the application to be used to each side of the neck in turn at every sitting.

The process of galvanization just described, it is right to

mention, is sometimes attended with more unpleasant results than those which this woman described. Some years ago I was attending a gentleman, aged forty-six, who suffered from epileptoid attacks and a variety of nervous sensations. On one occasion I applied this process to him, employing, however, a much more feeble current—that derived from five cells of Foveaux's battery. I noted before commencing that his pulse numbered 78, and was steady and good. He described himself as feeling better than asual. The application had only been continued during two minutes, when he changed countenance, complained of feeling faint, of a tightness about the brain, difficulty of breathing, and feeling of sickness. There was an imitation in fact of the feeling which preceded his attacks. I observed that his pulse had lost force and beat more slowly, that his face was pale, and his pupils widely dilated. With the aid of a stimulant he gradually revived sufficiently to leave my house. He did not come again.

I think it is difficult to feel convinced as yet that the process described is really a galvanization of the sympathetic. It must be remembered that the rheophore, when planted in the auriculo-maxillary fossa, is in the immediate neighbourhood of several important nerves, and indeed is nearer to them than to the superior cervical ganglion. That there is always a considerable diffusion of electricity from the spot to which a rheophore is applied, there can be no doubt. I have frequently observed, for example, that in attempting to galvanize the anterior tibial muscles of the leg in a case of infantile paralysis, the current has been conveyed to the muscles of the calf or the outside of the leg, and caused them to contract. It is impossible to conceive, therefore, that the numerous nerves which are to be found just below and about the temporo-maxillary articulation can escape at least some of the influence of the current when applied to this region. The important experiments of Brown-Séquard have shown us that galvanization of the sympathetic in the neck causes contraction in the walls of the arteries supplied by its branches. Now, branches from the superior cervical ganglion proceed to the internal carotid, forming the carotid and cavernous plexuses and following the vessels as they branch to their distribution. One of these ultimate branches, the central artery of the retina, is, thanks to the ophthalmoscope, within our ken. If the process described be a true galvanization of the sympathetic, we might expect to see, during its application, some alteration in the size or colour of this branch. On one occasion I got Dr. Tibbits, our electrician, to apply the process to the woman whose case I have above related, whilst I carefully watched the fundus oculi of the same side with the ophthalmoscope,

employing the direct image as being the largest and in all respects the most favourable for this observation. The woman had a large pupil, and the view obtained was exceedingly distinct. There was certainly no change whatever to be observed in the size or colour of the artery during the passage of the current, nor after its withdrawal. In the case last described it therefore seems at least as likely, I think, that the unpleasant effects upon the patient were produced by accidental galvanization of the pneumogastric as that the sympathetic ganglion was acted upon. It will be remembered that in 1846 it was shown by the brothers Weber that galvanization of the pneumogastrics in the neck caused the pulsations of the heart to become slower, and, if applied in sufficient strength, arrested its action altogether. So, again, it is conceivable that in the woman's case the relief she experiences may be owing to galvanization of the auriculo-temporal nerve, and possibly a thence reflected influence upon other branches of the fifth, for the rheophore is at least as near to this trunk as to the superior cervical ganglion.—*Practitioner*, *Feb.*, 1873, *p.* 81.

DISEASES OF THE ORGANS OF RESPIRATION.

25.—ON THE USE OF ERGOT IN THE HÆMOPTYSIS OF PHTHISIS.

By Dr. F. E. Anstie.

[The following all belong to a natural group of consumptive cases in which considerable hemorrhage precedes the development of any distinct physical signs. These patients are for the most part in comparatively good general health at the time of the first occurrence of the hemorrhage, and they usually possess an active circulation and a somewhat florid complexion.]

The first example was a typical case in a young man aged twenty-one, of tall and slight frame, and of decided consumptive family history; he had been working as a gas stoker, and although that occupation might be supposed to be very taxing to his constitution, he had followed it for a considerable period without feeling ill effects, and indeed was not aware of having ever suffered from illness. The first hemorrhage happened without warning: he had just come off night duty and was feeling very tired, when he suddenly felt faintish and had a salt taste in his mouth; a hacking cough came on, and then a gush of pure and somewhat bright-coloured blood came from his mouth, to the extent, as he declared, of nearly a table-spoonful. He lay down for some hours, during which

the bleeding did not recur; and towards one o'clock p.m. came to the Westminister Hospital to present himself as an out-patient. In the passage to the waiting-room he was again attacked with coughing and bleeding, and I saw about four ounces of blood in a gallipot which the porter had lent him. When he appeared in my room he was feeling somewhat faint and ill, with flushed cheeks and a very rapid small pulse. I advised him to come into the hospital, but he refused. I therefore examined and prescribed for him as an out-patient. On stripping him we found the chest apparently well formed and with good expansion; there was nothing abnormal in the breathing, except some jerkiness of inspiration over the upper half of the right lung, and a certain amount of indistinct small bubbling in patches over the same lung. He was ordered to take gallic acid in ten grain doses every four hours, and to remain on his bed quite motionless until the next out-patient day, with the usual precautions as to diet. In four days he came again to the hospital, and related that he had had no large return of hemorrhage, but that several times in each day he coughed up quantities of blood varying from a mere spot to a teaspoonful or more of pure blood. The treatment was continued for three days longer, with the addition of ice, which he frequently sucked in small pieces. On his next visit he reported that the hemorrhage had ceased for the last forty-eight hours; the same treatment was ordered for the next four days. On the next hospital day he reported that the bleeding had returned some hours previously; he looked exceedingly ill, and several times coughed while in my presence, bringing up small quantities of nearly pure blood. I now examined his chest again, and it was pretty obvious there was a considerable amount of blood retained in the tubes, and in fact I afterwards heard that next morning he brought up a considerable quantity, of very dark colour, feeling much relief to the breathing afterwards. The gallic acid was continued. Four days afterwards he reported that the hemorrhage was still very troublesome, though never coming in large quantities; he looked haggard, but still had a red flush on each cheek; I again carefully examined his chest, but could detect no further development of physical signs. I now determined to try ergot, and accordingly prescribed forty-minim doses of the liquid extract every four hours. This treatment was followed during eight days, when the patient left it off of his own accord because he had had no recurrence of the hemorrhage since taking the third dose of the ergot. Two days later he saw me again, and reported this result, remarking that he felt quite well, nor could I persuade him then to undergo any further treatment. This occurred six months ago. I have seen him once since then, when he

brought a brother to the hospital; I persuaded him to let me listen to his chest, and detected unequivocal prolonged expiration and dulness on percussion at the right apex, but I could not convince the man that he was at all ill and have not seen him since.

Another case was that of a boy of fourteen, remarkably tall and slender, who came as an out-patient with a history of blood-spitting for the last three days, apparently the result of a strain in fast running. It may be doubted if this case could confidently be called phthisical, but the boy's father was certainly consumptive. On inspection there were no physical signs whatever suggesting phthisis, but the boy was suffering from night sweats and had lost much of his muscular power within the last few months. The hemorrhage consisted of patches of blood mixed with mucus and fine froth, which were spat up after coughing, five or six times a day. The boy was of a florid complexion, very thin, and with a pulse of 100. Examination of the chest revealed absolutely nothing abnormal. Gallic acid was ordered in five-grain doses every three hours, with the usual diet and precautions. At the next visit, three days later, the hemorrhage was reported decidedly worse; and whilst in the room the boy several times coughed violently—only once, however, bringing up blood, but then to the extent of nearly a teaspoonful. He was ordered ergot in thirty-minim doses every four hours; and at the next visit, four days afterwards, reported himself quite free for the last two days from blood-spitting. He was put on cod-liver oil, and remained under observation until two months from his first visit, at the end of which time he was examined, and except a very slight dulness on percussion, and prolonged expiration at left apex in front, nothing wrong was detected.

The fifth case was that of a sempstress, aged nineteen, who came to the hospital complaining of acute pain under the left clavicle, cough, and blood-spitting, which had attacked her two days previously. She had always been rather weakly, but had had no important illnesses until she got typhoid fever, about a year before her coming to me. Ever since that she had been ailing, with a sense of general feebleness, but there had been neither cough nor expectoration till about a month before her coming to the hospital, when she got wet through and chilled: this seems to have produced severe bronchial catarrh, but she had hoped she was shaking the latter off. When examined she showed but little excitement of pulse or breathing, but had a hacking cough, and told me that she was spitting blood, in streaks, with almost every cough. Percussion revealed nothing abnormal; auscultation only detected some rather coarse râles posteriorly, on both sides. Ergot, in

40-minim doses of the ext. liq., was ordered every four hours: both cough and hemorrhage diminished after the first dose or two, and disappeared in less than thirty-six hours. The hemorrhage did not recur at all for nearly five months; she then applied for relief, saying that the hacking cough and blood-spitting had again returned, rather worse than before. There were still no physical signs of any permanent mischief in the chest; but the patient had wasted considerably, and complained of night-sweats and almost total loss of appetite. It was now determined to try acetate of lead, which was given in two-grain doses every four hours, the usual precautions as to rest and diet being enforced. This treatment was continued during three weeks, in which time the patient had in many respects singularly improved (*e.g.* in flesh and strength), but the cough and the blood-spitting remained almost as bad as before. The ergot was now prescribed in the same doses as at first: the effect on the bleeding was striking and immediate; after a very few doses it entirely ceased.

The sixth case was that of a married lady (suckling her second child), who was of very fragile and delicate appearance. Two years before she had been recommended to marry (and did marry rather suddenly) in the hope of arresting consumption, the danger of which had been intimated by an acute attack of hæmoptysis. She had not, so far, had any recurrence of the bleeding, and had kept pretty good health on the whole, till the present lactation, which had tried her exceedingly. At the time of her first visit to me she had begun to sweat most copiously, not only at night, but also at least once in the daytime; and the blood-spitting had returned. Pulse 98; resp. 28. Nevertheless, there were but trifling physical signs: scarcely more than a doubtful prolongation of expiration in the left supra-spinous fossa. The hæmoptysis was in bright red streaks after almost every attack of coughing, which was frequent. It was determined to treat her without any change in her circumstances except the administration of ergot in the usual doses; and this proved perfectly successful: the bleeding ceased almost immediately.

The seventh was that of an old woman of sixty-one with bright black eyes, parchment skin, and a lively, nervous manner. She said that she had seldom ailed at all, and accounted for the bleeding by her having strained herself in some household work: hæmoptysis came on in a sudden gush, after a not very severe fit of coughing. Examination of the chest showed traces, not very marked, of chronic bronchitis and emphysema; there was no detectable fever. The hemorrhage stopped after a very few ten-grain doses of gallic acid.

This woman's case developed into confirmed and rather rapid phthisis.

[In some cases hemorrhage into the lungs is not so much an effect of as a cause of phthisis. Blood retained in the air-cells is a direct irritant to the pulmonary tissues. It results from this that hæmoptysis should always be checked as soon as possible. There are rare cases in which this rule does not obtain, viz., where, along with a tendency to occasional extensions of consolidation already existing, there is an absence of softening and a clear history of relief to respiration and improvement in general health after a previous hemorrhage or hemorrhages. In none of the three following cases, however, would a passive attitude have been justifiable.]

Case 1.—Was that of a tinman, aged 37, a very intemperate man. He was in the habit of drinking half to three-quarters of a pint of gin daily, besides a variable amount of beer. The hæmoptysis had come upon him suddenly; a large gush of bright blood followed a coughing fit the day previous to my first visit, and recurred in the evening in the same sort of way. He was a middle-sized but powerful-looking man, though with the marks of drinking plainly set upon his face. He said that he was rather liable to colds, attended with violent spasmodic coughing, and that he had had such a cough for the last week or two. He also told me that he had several times suffered from attacks of very sharp stitch-like pain in the left side, which would last perhaps for two or three days, on and off; and that he felt "feverish" and bad at such times. On examining his chest it was evident that this man offered a good example of the commonest form of alcoholic phthisis, and that this affection had lasted some time. The left chest was markedly contracted; the infra-clavicular region was much sunken, and there was a considerable depression at the site of the old stitch-like pains; over the larger half of this side anteriorly, and to a less extent posteriorly, inspiration was harsh and jerking, expiration decidedly prolonged. Percussion over the same regions elicited a dull sound in patches; and, indeed, nearly the whole left chest was less resonant than the right. The patient was stringently ordered to abstain completely from alcoholic drinks, and to remain quiescent in the horizontal position; 2 grains of acetate of lead in pill, with $\frac{1}{4}$ grain of opium, and 2 drachms of infusion of digitalis in mixture, were to be taken every six hours. There was no recurrence of the hemorrhage during the next three days, but it then returned, in rather large amount, twice within twenty-four hours. On the second visit the man looked much worse; the complexion was of a streaky red and

yellow; the pulse 98; and the temperature (2 p.m.) was 101°·2: he complained of continuous and severe pain at the old place in the left side. Forty minims of liquid ext. ergotæ were ordered every four hours, and the effect was decided: the excited pulse subsided, the pain in the chest abated, and there was only one slight recurrence of the bleeding during the next week. On his appearance at the end of that time at the hospital, the patient looked greatly better: he continued to take the ergot during three weeks. Examined at the end of that time, he was found to present just the same physical signs as at first; but his general health had greatly improved, the cough had ceased, and he was not conscious of any pain or inconvenience in the chest.

Case 2.—Was that of a blacksmith, aged 24, intemperate, who had been working with increasing difficulty at his trade, owing to a feeling of dyspnœa which had troubled him for about ten months. His father had died of consumption at the age of 36; he had himself suffered from cough and a sense of oppression at the chest, which had never left him after a severe cold, with bronchitic expectoration, which attacked him in the beginning of the winter 1870-1, and was rather worse than usual when he first came to me in March 1872. At this time there was a considerable amount of catarrhal bronchitis: rhonchus and sibilus, mingled here and there with coarse moist râles, were scattered over a large part of both lungs; there was also slight fever and somewhat quickened pulse. The patient was treated with liq. ammon. acet. ʒ iij. and decoct. senegæ ℥j. ter die, and desired to remain indoors. At his next visit, four days later, the bronchitic sounds had nearly vanished; the sputa were less frothy and profuse, but there were pain and burning soreness under the sternum and in the right infra-clavicular and mammary regions; the temperature was found to be 100°·4 (at 1.30 p.m). A more careful examination of the chest now showed that there was less complete expansion of the upper portion of the right chest than of the left; and about two and a half inches below the right clavicle there commenced a patch of rather marked dulness, which occupied an irregularly shaped space, the total area of which may have been equal to that of a crown-piece. Breathing was harsh (indeed semi-tubular) at this place, and expiration much prolonged. At the posterior aspect of the same lung the same percussion and auscultation sounds were heard over a rather smaller space and a little lower down. Four days later the patient again presented himself. It appeared that, on the evening before, he had been seized, rather suddenly, with pain under the left mamma, and short breath: an hour and a half later he coughed a good deal, and then his mouth was filled with very bright red blood;

this happened three times more in the course of the night. About 4 a.m. he fell into a heavy sleep that lasted till 7.30, when he awoke bathed in perspiration, and coughed up about a tablespoonful of rather darker blood than that which had come at first. When he came to the hospital he was pale (but for a small red spot in each cheek), trembling, and very anxious-looking; pulse 108 and very weak. He said that on his way to the hospital he had to sit down several times on doorsteps, and that he had been coughing small quantities of blood all the morning. The chest was carefully examined, and the left lung was found to be entirely free from signs of disease; its sounds were puerile, as might be expected from the state of the other lung. In the latter, the old harsh sounds were only very imperfectly heard, being much mixed with and confused by rather large bubbling râles. The coughing up of blood, though in small quantities, was so persistent that—taking his history into consideration—I was much inclined to believe that an aneurismal dilatation of one of the pulmonary vessels had given way. As he had been taking the acetate of lead and sucking pieces of ice up to the last moment with apparently no effect whatever, I now ordered 40 min. of the liquid ext. ergotæ every four hours, and particularly desired that when the cough came on he should be raised (not lift himself) and assisted to lean forwards, so that, as for as might be, the bloody sputa might be expectorated rather than retained on the lung. When I saw him three days later, his appearance was remarkably improved, though he still looked pale and weak. There had been no hemorrhage worth mentioning after the fourth dose of the ergot, and from the first it seemed to decidedly check the bleeding. He continued taking the ergot steadily for a week, at the end of which time he was probably in the same state as before the illness; that is to say, his right lung remained in a state of what might be called chronic "fibroid phthisis," with scarcely any active processes going on. For some three or four months I kept this man in view, and the hemorrhage did not recur. He took some cod-liver oil, and was fairly abstinent from drink as long as I saw him. He disappeared from my observation about nine months ago, and has not applied to me again.

Case 3, is that of a single woman, aged 40, a machine-sempstress. She applied to me in great alarm on account of a series of bursts of hemorrhage, preceded by only moderately severe cough, which had come upon her during the last four days: on some nine or ten occasions she had brought up quantities varying from a mere spot to a tablespoonful or more. Finding that her menstrual flow had been somewhat rapidly diminishing, I hoped that the incident was only temporary and

unimportant: but on examining her chest I found scattered patches of decided consolidation in both lungs. Alum was prescribed in 10-grain powders every four hours, and continued for a week but with no success: the ergot, in the usual doses, was then ordered, and the hemorrhage diminished at once, and disappeared in the course of three or four days. I think it probable that the severity and obstinacy of the hemorrhage were in some measure influenced by a disturbed state of circulation due to a rather brusque process of uterine involution; but it should be mentioned that the period of pulmonary hemorrhage did not correspond with the usual dates of this patient's menstruation.

The last part of this inquiry concerns the administration of ergot in cases of advanced phthisis where a rapidly advancing destructive process cuts into vessels of considerable size which had remained fully pervious. The emergency may be extreme and most alarming; the hemorrhage being considerable in quantity, and liable to recur constantly: moreover, the irritative effect of the effused blood in the air-cells is apt to be extremely severe; in fact, may produce pneumonia which kills the patient in a very few days.

1. The first case of this advanced kind in which I employed ergot was indecisive, though encouraging, as to the results. The patient was a personal friend, whose illness I had watched during more than three years. Hemorrhage had been by no means a conspicuous feature of his case: it had occurred only occasionally and to an unimportant extent in the earlier stages. The disease was chiefly, if not altogther, in the right lung. He had being going steadily down-hill for about six months, with continuous evidences of softening, till, in the last week of 1871, he was attacked with violent and repeated hemorrhages of florid blood. His usual remedy, glycerine of gallic acid, seemed to have comparatively little influence on the bleeding, and I accordingly employed ergot. I scarcely remember why it was that in this case I used the tincture, instead of the liquid extract which I generally used, and which I believe on the whole to be considerably more efficacious. However, I had no doubt at the time that the medicine exercised a really controlling influence over the bleeding, which immediately diminished very much. Unfortunately the mischief was done: the effused blood excited intense pneumonia, which carried the patient off a week later.

2. In a case which occurred very soon after this, I was called to a gentleman, aged 47, who had suddenly lost a "pint" of bright red blood. This was his first hemorrhage. It appeared that he had suffered undoubtedly consumptive disease (consoli-

dation of both apices), for seven or eight years; but no softening had occurred until a month previously to the bleeding, when he had taken a violent cold, which at once lighted up active mischief. Already there was a cavern of considerable extent in the right upper lobe, and patches of subcrepitation in various parts. Before the hour appointed for the visit arrived, the hemorrhage recurred to the extent of a teacupful, and the patient went on spitting some bright blood after every cough. Here the liquid extract of ergot was at once employed in 40-minim doses: the hemorrhage was markedly influenced by the first dose, and stopped entirely after the second. So far as I am aware, this patient (who died about three months later) never had any recurrence of the bleeding.

3. A case occurred in the out-patient practice. The patient was a woman aged 60, much emaciated, who had been a sufferer from what she called "asthma" for more than twenty years. The story appeared to be that of chronic bronchitis passing at last into phthisis. There were extensive consolidation in the left lung, and patches of dulness in the right; moreover, there was a well-marked cavern in the left upper lobe. Hemorrhage had never occurred till a week previously, but had recurred several times since then. Forty-minim doses of the liquid extract were given, and the hemorrhage quickly stopped.

4. Against these favourable examples of the action of ergot in hemorrhage of advanced phthisis, I must set the case of a patient who was recently under my charge in Westminster Hospital (Burdett Ward.) Here the hemorrhage was continuous and large in amount (taken altogether), and after various other remedies had been tried in vain, a fair and persevering trial was given to ergot; but the hemorrhage was not in the least affected. Acetate of lead finally stopped it.—*Practitioner, Feb. and April*, 1873, *p.* 65, 224.

26.—ERGOTINE, ITS USE SUBCUTANEOUSLY IN HEMORRHAGE.

Dr. Drasche believes that ergotine must be regarded as the best of all hæmostatic agents for hypodermic use. On two persons, in robust health, the injection of from $\frac{1}{2}$ gr. to 2 grs. was uniformly followed by a diminution in the pulse of from 4 to 6 beats, and the sphygmograph showed a simultaneous contraction of the calibre of the vessels. The temperature was slightly raised, respiration normal, no influence upon the urine, and the health was quite undisturbed. Some local irritation was caused, but usually passed away soon. Dr. Drasche has employed this method chiefly in tubercular hæmoptysis in doses

of ½ to 1½ grs., and in most of the cases the efficacy of the ergotine was very prompt, when other hæmostatics had previously been tried without success; in others, although less speedy, it was still successful, and in one case only out of nine did it fail. In two cases of epistaxis the effect was very speedy, and the dose required very small. It has also been used with marked advantage in hæmatemesis, intestinal hemorrhage, and hemorrhagic scorbutus. The best vehicle is glycerine, containing 5 grs., in ʒ i., and the injection is best made in the region of the pectoral muscles. When the injections have been long continued, or have been too strong, tingling of the finger-ends and cramps of the hands have been sometimes complained of.—*Wien. Med. Wochenschr.*, *Med. Times and Gazette*, *Nov.* 16, 1872.

27.—ON INFLAMMATION OF THE LUNG AS A CAUSE OF CONSUMPTION.

By Dr. Arthur Ernest Sansom, Physician to the Royal Hospital for Diseases of the Chest, City-road, and to the North-Eastern Hospital for Children.

Condensation and Destruction of Portions of the Base of the Lung in persons manifesting no signs of tendency to Tuberculosis—Consecutive Phthisis.

Case 1.—*Cavity in the Base of the Left Lung—Hœmoptysis—Purulent Sputa—Subsequent Condensation of Right Apex.*—John R., aged 20, grocer, of muscular appearance, applied at the Royal Hospital for Diseases of the Chest, September 30, 1870. He complained of cough, especially at night and early in the morning, with expectoration of thick phlegm occasionally mixed with blood. Had been ailing for seven years, and frequently had cough; began to spit blood four years ago, sometimes as much as two fluid ounces at a time. No night sweats; no loss of flesh; he had gained three pounds in three years. There was practically no family predisposition to phthisis; the only instance was his father's father, who died of consumption (?) at the age of 56.

Physical Signs. There were no abnormal signs whatever, except over a limited space in the base of the left lung near the scapular angle. Here breathing was tubular, and at one spot there were undoubted gurgling râles.

Treatment. Quinine and cod-liver oil, with sedatives for cough. Patient improved in general health; sputa were at first pinkish and muco-purulent.

On October 12 expectoration at one time of two fluid ounces of pus took place.

On the 29th hæmoptysis returned, but ceased after the administration of ergot.

On January 20, 1870, sputa were slightly blood-stained. The physical signs remained as before over a space of two inches in diameter; gurgling very manifest. He had gained weight from 8 st. 4 lbs. to 8 st. 13 lbs., and on March 3 to 9 st. 1 lb.

In March there was increased cough, and loss of weight to 8 st. 10 lbs.; but in April he improved considerably.

I did not see him again until January 10, 1872, when he told me that he had remained in fair health, but always with some cough, till the end of July or the beginning of August, 1871; he then wasted considerably; in November slight hæmoptysis had returned. On examining the chest I found over the spot of old mischief the croaking sounds of a small cavity surrounded by large râles, and around this finer râles. The right apex as far as the second rib was dull, and over it was heard diffuse tubular respiration and the voice-sounds exalted.

Case 2.—*Pneumonia of Base of Left Lung with Emphysema—Cavity—Progressive Phthisis.*—John H., aged 35, smith, applied at the Royal Chest Hospital, February 3, 1871, suffering from headache, short breath, and cough, with opaque yellow sputa. He suffered cough in infancy, but had no other ailment till a month ago, when an acute cold came on, and he was confined to his bed for a week. His mother was asthmatic, but there had been no consumption in his family.

Physical Signs. Right lung, front and back, exalted resonance. Left base: front dull; very abundant liquid râles, fine and coarse; back, bronchial breathing with abundant râles. Ordered blisters over left base, front and back; effervescing ammonia mixture. After fourteen days' treatment cod-liver oil ℥ss. bis die. Continued with very slight improvement, and on March 4 admitted as in-patient. Cough was now very distressing; sputa muco-purulent and blood-stained.

March 10. Physical signs: Dulness confined to axillary and infra-spinous regions (base); over axillary region, friction; close to angle of scapula a patch of coarse, very liquid râles, approaching gurgling; breathing bronchial in patches, with loose râles. Ordered carbolic acid inhalations; quinine and ether; counter-irritation by pigmentum iodinii.

20th. Discharged from hospital at his own request, to continue as out-patient; he had gained eight pounds whilst under treatment.

On 24th gurgling was very manifest, and there was a "splash" with each impulse of the heart heard over the cavity. The signs continued without change until April 27, when he ceased attending.

Case 3.—*Condensation of Base of Left Lung in subject of Chronic*

Bronchitis—Hæmoptysis—Improvement—Return of Symptoms with Condensation of the Upper Lobe of the Right Lung.—S. B., aged 36, porter, applied at the Royal Chest Hospital, July 15, 1870; complained of pain in back and in abdomen, giddiness, and cough. He had been subject to "asthma" since boyhood. He was seized a week previously to application with rigors and vomiting; hæmoptysis followed. He says he expectorated half a pint of blood. There was no obvious predisposition to phthisis.

Physical Signs. Rhonchi generally over all the chest; at the back over the base of the left lung abundant moist râles, some very fine.

Treatment. Blister over left base; effervescing mixture with iodide of potassium; after fourteen days quinine with ether. Considerable improvement followed, but râles were heard in patches over the affected base. He gained weight, from 7 st. 7 lbs. to 8 st. 8 lbs. He continued treatment till December 9, and then stopped away for a fortnight. On reapplying there were general rhonchi, but no notable signs about the formerly affected base, but deficient resonance with moist râles over the upper lobe of the right lung.

Neither the signs manifested by these patients nor the details of their histories resemble the signs and course of tubercular phthisis; nevertheless, we observe progressive invasion of lung tissue with induced conditions which are clinically indistinguishable from the results of tubercle. The first case points the importance of carefully examining the base of the lungs in those manifesting signs of pulmonary disorganization. I am quite sure I might easily have overlooked the small cavity which was nevertheless manifested by undoubted signs. We are accustomed to think that the initial lesions in ordinary cases of phthisis are, in the great majority of cases, situated in the apices or upper lobes of the lung. Is it not legitimate to hesitate before accepting this doctrine, and to consider whether, in many cases, there has not been broncho-pneumonia of the base, occurring at a period anterior to our examination, the signs of which have disappeared? In these cases there was undoubted broncho-pneumonia of patches of the lung, with more or less disorganization up to the production of cavities. Consecutive to this was condensation of other portions of the same or the opposite lung. What was the relation of these secondary consolidations to the primary lesions? Let us briefly consider the course of pathological changes in a broncho-pneumonia which induces disorganization of tissue. The accumulated exudation cells resulting from the inflammation produce pressure; such pressure exerted on the capillary vessels may cause degeneration and destruction of these vessels, and consequent hæmop-

tysis; or, further encroaching on the surrounding tissue, the pressure causes "the walls of the alveoli, deprived of nutritive fluid, to degenerate and die" (Niemeyer). What is the consequence of such breaking down of tissue in ever so small a portion of the lung? The conditions are dying and dead organic matter in constant relation, according to the physiological necessities of the lung, with air. The result must inevitably be putrefaction. We have, then, existing within the lung itself a manufactory of septic poison. The experiments of Villemin, Andrew Clark, Burdon-Sanderson, Wilson Fox, Cohnheim, Fränkel, and many others, have proved that in animals the inoculation of putrescible matter is followed by lesions indistinguishable from tubercle of the lungs. "Those materials," says Dr. C. J. B. Williams, "are most sure to produce tubercle, which either resemble it in its tendency to decay, or show a septic character, as foul pus, putrid muscle, carious bone, and the like." The probabilities of septic matters causing tubercle in the human subject were dwelt on by Dr. Andrew Clark in a paper read before the Medical Society of London, and published in the *Medical Times and Gazette* of May 23, 1868. What I wish to point out is, that in any case of local inflammatory mischief of the lung which has been of sufficient intensity at any point to cause a breaking down of the tissue of the lung, a manufactory of septic poison is instituted, which analogy and experience tell us is capable of transmission by the lymphatics of the pulmonary structure, with the effect of producing actual tubercles in the lungs. And I contend that there is sufficient evidence to show that this is a cause, and probably a frequent cause, of the disease which we know as pulmonary consumption.

I think most observers will agree that when once a cavity has formed in even a limited portion of lung the danger of implication of other portions is far greater than it was before. Yet it may be objected that all cavities in the lung do not lead on to pulmonary tubercle—witness pneumonic abscess. It must be recollected, however, that the view I have just propounded requires the concurrence of two conditions for the dissemination of tubercle. First, the breaking down of tissue, and communication with air sufficient to induce decomposition; secondly, the taking up of septic material, thus produced, by the absorbents. So, if the cavity in the lung tissue be lined by a false membrane, or if the tissue surrounding it be so indurated as to obstruct the lymphatics in their work of absorption, the septic poisoning will not take place, and the excavation be noxious only *per se*, and not as a centre for the dissemination of tubercles.

Many physicians must, like myself, have met with many

cases of chronic bronchitis passing into phthisis. Patients past middle age, who have suffered from ordinary winter cough for many years, in whom no tendency to tubercle during the ordinary course of their bronchitis was ever suspected, get an attack of more than ordinary severity; after this there is a change from their former symptoms, their pulmonary distress is no longer intermittent, but constant—they waste, they manifest hectic fever, and finally assume all the characteristics of ordinary pulmonary phthisis. Observation of these cases shows that the first sign differentiating from ordinary chronic bronchitis is localization in certain parts of the lung of patches of moist râles, both fine and coarse; diffuse tubular breathing is sometimes heard over them, but is often masked by the other bronchitic sounds; and dulness is sometimes, but not always, detected, because frequently the surrounding lung is super-resonant from emphysema. The material point is that there are patches of lung where these moist sounds constantly are heard. These are patches of broncho-pneumonia; if they can be watched they will be found to manifest coarser and coarser râles, until there are undoubted signs of cavity. Gradually the lungs become more and more extensively involved, and the signs, as well as the symptoms, are not to be distinguished from those of the third stage of phthisis.

I think that the extant evidence is sufficient to show that under the term pulmonary phthisis, as ordinarily used, are grouped many varieties of destructive disease of the lungs. It must be the labour of clinical observers to carefully differentiate these varieties. The large number of practitioners who have hitherto been accustomed to consider all cases of phthisis as cases of tuberculosis, will, I feel convinced, be induced, on reconsidering the question, to modify their views. Clinical and pathological research has much yet to do for the elucidation of the subject; but it appears to me that our present knowledge tends to the following points:—That local inflammations of the structure of the lungs, due to various initial causes, are capable of inducing all the symptoms and conditions of pulmonary phthisis; that consolidations of portions of the lungs, the result of such inflammations, are capable of resolution and absorption with restoration to normal health in many cases, even in those manifesting an apparently strong predisposition to phthisis; that there is no special diathesis which is associated with the production of a morbid poison called tubercle; that tubercles are portions of the tissues and exudations of the body in a state of degeneration; that they occur chiefly in weakly subjects, because such persons are predisposed to the low forms of inflammation that induce them, and have less chances of such inflammation ending in absorption and recovery; that the

dissemination of tubercles throughout the lungs is effected by the lymphatics, which are well known to be influenced by septic matter; that in many cases of pulmonary phthisis it is very probable that a local inflammation has led to destruction of tissue, formation of cavity, decomposition of organic *débris*, absorption of septic material thus produced, and institution of new centres of tuberculous change on account of the poisoning of the lymphatics.

The special lessons concerning treatment inculcated by such considerations are—(1) to watch with great care inflammatory affections of the lung, however slight and apparently trivial, and never to feel satisfied until every trace of a local condensation has passed away; (2) to increase by every reasonable means, nutritive and medicinal, the powers of repair, so as to obviate the greatest danger in local affections of the lung—viz., the breaking down of tissue; (3) to prevent or arrest in whole or in part putrefactive decomposition in the lung structure. To this end I believe that antiseptic inhalations and antiseptic medicines are very valuable; but let no one imagine that they supplant the necessity for the adoption of means for promoting systemic nutrition, or for the careful treatment of intercurrent complications.—*Med. Times and Gazette, Dec.* 14, 1873, *p.* 648.

DISEASES OF THE URINARY ORGANS.

28.—OBSERVATIONS ON THE SKIM-MILK TREATMENT OF DIABETES MELLITUS.

By Dr. Arthur Scott Donkin, late Lecturer on Medical Jurisprudence and Toxicology in the University of Durham, late Physician to the Sunderland Infirmary.

I desire to be clearly understood as to what I mean by this term. To order the patient to drink as much skim-milk as he can, and whenever he chooses, regardless of measure, or the time of administration, or to permit him to partake of other kinds of food in addition, even in small quantities, is certainly *not* prescribing the skim-milk treatment. I have known so much as from sixteen to twenty-six pints swallowed daily by the patient, who was thus converted into a species of funnel, through the permission of his medical adviser. Of course it was not at all astonishing that this unmethodical but heroic administration of the remedy was *not* crowned with success.

By the skim-milk treatment, I mean the administration of skim-milk properly prepared, in quantities measured and limited to the requirements of individual cases, given at regular intervals in definite doses, and to the exclusion of all other food for a longer or shorter period, This system of treatment, in short, must be pursued in a strictly methodical manner, and according to the rules I have already laid down on this subject, and I must add, emphatically, *that if this is not done success must not be expected.*

On account of the scrupulous method, perseverance, and self-denial required, this treatment will never be attended with more than partial success in hospital practice, unless the patients are placed in isolated, special wards, and under the care of strictly trustworthy nurses. Of this I am convinced by my own personal experience in the cases of diabetes I treated in the Sunderland Infirmary. In all of these, without exception, no sooner was the sugar nearly or entirely removed from the urine, than the patients began to indulge clandestinely in the most injurious of the prohibited articles of food, and thus caused a return of the disease. The same observation applies with equal force to the more ignorant and unintelligent of the lower classes treated at their own homes, and to young subjects below the age of maturity. I fully concur with Bouchardat, that this cause exercises an important influence over the great mortality occurring amongst the latter class of patients.

The space at my command will only permit me, on the present occasion, to introduce to notice two additional cases, which may be regarded as typical illustrations of what can be achieved by the skim-milk treatment in a large majority of instances. In the first case the disease had not proceeded beyond the stage in which it is curable. The second, however, was too far advanced, and the vital powers too much impaired by the long continuance of the disease in a severe form, to permit of much hope of complete recovery, yet not so near the final period as to preclude the possibility of much improvement. I may mention that similarly beneficial results are not to be expected in cases complicated with tuberculosis or other necessarily fatal diseases; even although in these a great amelioration of the symptoms can generally be obtained.

Case of confirmed Diabetes; removal of the sugar from the urine in fifteen days; complete and permanent recovery.—This is the case of a gentleman, aged forty-seven years, suffering from diabetes, sent to consult me by his medical attendant, Mr. G. T. Keele, of St. Paul's-road, Highbury, London. The patient consulted me on the 16th of May, 1871, when I ascertained

that the disease, then fully developed, had lasted at least two years, and probably longer, and was first detected about eighteen months previously, when he was slowly recovering from an attack of pleurisy. Shortly after this event, in consequence of overwork in commercial pursuits, and a severe attack of cold which aggravated the diabetes, his general health became seriously impaired, and he began to suffer so much from debility, that entire rest and change of air were recommended as essential for his recovery. Consequently he went to Torquay and Hastings, whence he returned improved in health and spirits; but, unfortunately, the urine continued as much loaded with sugar as before, and had a specific gravity of 1036. It is necessary to add that the diet of the patient had been restricted during this period and up to the time I first saw him.

At the date just mentioned, when the patient consulted me, he presented the usual symptoms of diabetes, but rendered less intense by the treatment to which he had been subjected. He had lost much flesh since the commencement of the disease; his urine had a specific gravity of 1040, and contained no less than 27·374 grains of sugar to the fluid ounce; the quantity voided daily being about six pints. He presented another symptom frequently observed in cases of confirmed diabetes——namely, a soft, spongy, painful condition of the gums, with looseness of the incisor teeth; a state indicating a deficient or unhealthy nutrition produced by a depraved blood, not only contaminated by an injurious foreign substance—sugar,—but also deficient in the products derived from the healthy assimilation of the proximate principles of food. This state of the gums is similar to that met with in scurvy, and apparently due to a similar cause.

On the 19th of May the patient was placed under the skim-milk treatment, *systematically* applied; and he, being a gentleman of superior intelligence, adhered most rigidly to the instructions received, and scrupulously followed the rules to be observed in applying this treatment.

The daily allowance of skim-milk, having a specific gravity of 1038, was at first seven and then eight pints, divided into meals taken at regular intervals. No other food whatever was taken during the next six weeks, and during the whole treatment of this case not a single dose of medicine of any description was administered.

The progress of the case was watched from day to day by Mr. Keele, and the patient kept a table with the utmost precision, showing the state of the urine, which was daily examined for sugar by Moore's and Trommer's tests. The effect of the

treatment on the urine during the first four weeks, is shown in the following table:—

May 16. *Urine contained* 27·374 *grains of sugar per ounce, specific gravity* 1040.

	Pints of urine daily.	Specific gravity.
May 19	$4\frac{1}{2}$	1037
,, 20	$4\frac{1}{2}$	1040
,, 21	5	1038
,, 22	4	1030
,, 23	4	1036
,, 24	4	1035
,, 25	$3\frac{1}{4}$	1033
,, 26	$2\frac{1}{2}$	1035
,, 27	$2\frac{1}{2}$	1026
,, 28	$3\frac{1}{4}$	1015
,, 29	$3\frac{1}{4}$	1010
,, 30	2	1022
,, 31	3	1015
June 1	3	1012
,, 2	$2\frac{3}{4}$	1015
,, 3	$3\frac{3}{4}$	1009
(No sugar.)		
,, 4	$2\frac{1}{2}$	1022
,, 5	$3\frac{1}{4}$	1006
,, 6	$3\frac{3}{4}$	1015
,, 7	$3\frac{1}{2}$	1012
,, 8	$4\frac{1}{2}$	1006
,, 9	5	1006
,, 10	4	1006
,, 11	$4\frac{1}{2}$	1006
,, 12	$5\frac{1}{4}$	1012
,, 13	$3\frac{1}{4}$	1015
,, 14	4	1014
,, 15	$4\frac{1}{2}$	1013

During the following (last two) weeks of the purely skim-milk regimen the daily quantity of urine ranged from four to five pints, and its specific gravity varied from 1008 to 1015.

During the first three weeks of the treatment the patient went only for an hour daily to his office, spending the rest of the day in working in his garden. This occupation caused him to perspire more or less freely, and on some occasions most profusely. It thus produced the considerable variation in the daily quantity and specific gravity of the urine especially observable in the second and third weeks, and the smallness of its quantity compared with that of the skim-milk taken during that period. This was particularly observable on the 30th of May and 4th of June.

There was not much diminution in the quantity of urine or sugar, nor other improvement, during the first week, but from the beginning of the second it commenced to subside rapidly until on *the fifteenth day of the treatment, June the 3rd, it had entirely disappeared.* On this day the quantity of urine was three pints and three-quarters, and its specific gravity 1009.

It is necessary here to record that from the first day of the treatment on the 19th of May to the 15th of June the patient lost weight, at first rapidly and afterwards slowly; so that in the space of twenty-eight days he lost fourteen pounds, notwithstanding the fact that at the end of this period he felt very much stronger and better. There can be no doubt that this loss of weight can, to the extent of a few pounds during the first fortnight at least, be accounted for by the much smaller quantity of fæcal matter contained in the intestines under a skim-milk regimen than under an ordinary solid diet, and by the removal of the sugar from the blood, fluids, and tissues previously saturated with this heavy substance, which thus adds considerably to the weight of the entire body. But it would appear also that, independently of these causes, the body had lost weight.

During the whole period of the treatment the pulse was natural, and ranged from 66 to 70.

At the end of the third week, June 8th—a week after the disappearance of the sugar from the urine—the state of the gums had very much improved, and the teeth had become firmer. At the end of the fourth week (June 15) the patient began to take an additional two or three pints of skim-milk made into curd, daily, by the essence of rennet, a pint for each meal.

At the end of the sixth week (28th June) he was allowed a small steak for dinner, and on the following day took fish and butcher-meat in addition to the skim-milk and curd. This change in the diet did not cause the slightest return of sugar in the urine, and the patient now, to use his own expression, felt "well and hearty."

On the 1st of July he began to indulge in forbidden articles of food containing large quantities of starch and sugar, and some sugar again appeared in the urine, but rapidly disappeared again on his resuming the skim-milk diet for three or four days.

From this time onwards the patient took solid animal food at breakfast, dinner, and supper, in addition to the skim-milk, which he drank largely at meals instead of water, and which thus continued, and is still continued, as a staple article of food; he also took a Blatchley's bran-biscuit at each meal, but this was afterwards superseded by the use of gluten bread. The animal

food was of great variety—namely, beef, mutton, veal, lamb, tongue, lean ham, chicken, turkey, game, eggs, lobster, shrimps, and fish in every variety. He was also allowed every description of green vegetables, including even asparagus and French beans. But saccharine and starchy food, and butter, bacon, and fatty substances and cheese, were forbidden. The dietary was thus most varied and generous, and contained all the proximate alimentary principles, and everything else requisite for the healthy nutrition of the body.

Up to this period alcoholic drinks had been strictly prohibited, but in September the patient began of his own accord to take dry sherry, claret, Burgundy, Scotch whisky, or brandy in moderate quantity daily, and felt very much better in consequence, and without any return of sugar in the urine.

On the 12th of October I examined the patient at his own house, in consultation with Mr. Keele, when we found him entirely free from the disease. He felt remarkably well, and his urine did not contain the slightest trace of sugar, notwithstanding the fact that for three months previously he had attended closely to his office and to business for several hours daily. His diet at this period was that which I have just described.

In accordance with advice given he started early in the following month—November—to spend the winter in the south of Europe. He remained some time at Mentone, spending the day-time chiefly in taking exercise in the open air, feeling all the while healthy and vigorous, and living on the same generous diet as previously. He then visited Venice, Rome, and Naples, and returned home through Spain and France. I saw him in April last, 1872, after his return; he was wonderfully improved in appearance and was in excellent health. During the past summer he took a tour into Sweden, and felt benefited thereby. I will only add that not only does the patient continue free from disease, but he even appears to be better than he was previous to his having become affected by it. Thus, in a letter written on the 16th of October last, nearly sixteen months after his recovery, he wrote to me saying, "I am at present better and stronger than I have been for years."

There can be no doubt whatever that a long holiday with plenty of exercise, under a genial atmosphere, with change of scenery and complete relaxation from business, contributed powerfully to confirm the health of the patient.

I am the more anxious to direct attention to this circumstance, having ascertained by experience in similar cases that hygiene and relaxation from business or professional pursuits for a considerable period are of the utmost importance in the after-treatment of diabetes, when convalescence has been fairly

established. I can point at least to one melancholy instance in which a return of the disease in a severe form was induced by close attention to business in gloomy premises, and continued residence in an unhealthy atmosphere, nearly a year after every trace of sugar had been removed from the urine, and the health and strength of the patient completely restored.

If space had permitted I would have cited other instances, in addition to the above and the other cases already published in my previous contributions, to show the remarkable efficacy of the skim-milk treatment of diabetes—*properly applied*. But these are certainly sufficient to carry conviction to an unprejudiced mind that the disease is quite amenable to treatment if the remedy *is applied in time*.

In cases of diabetes too far advanced to admit of cure and the consequent removal of the sugar completely from the urine, the skim-milk treatment will reduce the quantity of sugar to a very much greater degree, and hold the disease in check far more powerfully than any other remedy yet discovered, to say nothing of the subjugation of the more distressing symptoms, as already described in my previous contributions. In illustration of this effect in such instances, I will cite the following case, in which a diet restricted (except the lactine of milk) to purely nitrogenous substances, was subjected to a lengthened trial in the first instance, and then an exclusive regimen of skim-milk.

W. B., aged sixty years, lost his health two years ago, when he was obliged to give up work, and began to lose flesh and weight rapidly (his weight at that period having been 15 st., but now reduced to 8 st. 13 lb., showing a loss of 5 st. 13 lb. up to the present time). At the commencement of his illness his appetite greatly increased, and he began to suffer from excessive thirst, great debility and loss of muscular power, a greatly increased flow of urine, and a dry skin. These symptoms have since gone on gradually increasing. The large flow of urine induced him to remark to his medical attendants that his blood was going to water, but still the disease remained undetected until it was recognised by another practitioner in April, 1872, or eighteen months after the health of the patient broke down. When closely questioned on the subject, the patient stated distinctly that long prior to the period he fixed as the beginning of his illness (when he could no longer work) he suffered much from debility, weakness of the limbs, and general indisposition. The disease, therefore, as usual, appears to have come on insidiously, and to have had its origin at a date long anterior to the period when it became so fully developed as to cause a complete break down of the patient's health, and the accompanying great emaciation and other distressing symptoms indicative of an advanced stage of the malady.

When I first saw the patient on the 10th August, 1872, he suffered from the symptoms just enumerated, and complained much of weakness and diminished sensibility of the limbs and loss of sensation in the feet, almost complete in the soles, so that his gait, with the assistance of a stick, was very unsteady. For months previously he had confined himself to a diet consisting of 1½ lb. of beef or mutton, green vegetables, and a moderate quantity of ship-biscuit, and a quart of milk daily; he also drank water. He was passing from 8 to 9 pints of urine having a density of 1040, and (on the 10th of August) containing 21·247 grs. of sugar to the fluid ounce.

He was now placed on a restricted diet consisting of 1 lb. of lean chop or steak, taken at breakfast and dinner, three or four pieces of gluten bread, and from 7 to 8 pints of skim-milk daily. All saccharine and starchy matter (except the lactine of skim-milk) and fat in a great measure were thus excluded. This regimen was strictly adhered to for a period of nine weeks, but with only slight improvement in the condition of the patient, so that on the 12th of October he was voiding 7½ pints of urine, specific gravity 1038, and containing 25·340 gr. of sugar to the fluid ounce.

He was now subjected to an exclusive skim-milk diet (9 to 10 pints daily, 3 pints being made into curd, and taken at three meals). The following table shows the result on the disease, as revealed by the rapid and remarkable diminution in the quantity of urine-sugar. I must add that the quantitative estimation of the sugar was made by the beautiful polarising saccharimeter of Soleil, perfected by the manufacturer, Duboscq, of Paris, by which the most exact results are easily obtained.

	Pints of urine daily.	Specific gravity.	Grains of sugar per fluid oz.
Diet restricted to meat, gluten, bread and skim-milk, end of ninth week.			
12th October	7½	1038	25·340
Exclusive skim-milk diet begun 12th October.			
16th October	6	1030	19·797
22nd ,, ...	6	1021	12·670
26th ,, ...	6½	1015	7·419
30th ,, ...	6½	1020	9·502
1st November	5½	1020	10·294
4th ,, ...	6	1015	7·127
8th ,, ...	5	1012	2·771
12th ,, ...	5¼	1007	1·583
18th ,, ...	4¾	1010	2·375

It will thus be observed that in the space of thirty-six days the skim-milk treatment gradually reduced the quantity of urine-sugar from 25·340 gr. to 2·375 gr. per fluid ounce of urine—a diminution equivalent to 22·965 gr. per ounce,—and at the same time decreased the daily quantity of urine to the extent of $2\frac{3}{4}$ pints.

This case is not only of very great importance in illustrating the remarkable potency of skim-milk in checking the disease and preventing the formation of sugar, but it is extremely valuable in demonstrating, in the clearest possible manner, the fact that skim-milk loses its curative power altogether, and becomes valueless as a remedy, in diabetes, when administered in combination with solid animal or other nitrogenous food. I have repeated the experiment over and over again, with every variety of modification, in similar cases, and always with the same result.

I may add that the improvement in the general health of the patient, and in the more important or distressing symptoms, especially in the loss of sensation in the feet and legs, has been quite commensurate with the decrease of the urine-sugar. He now walks steadily and with a firm step. He is still under treatment; but a complete recovery is scarcely to be expected.

In the treatment of diabetes it must be remembered that the source of the urine-sugar is the food. The most remarkable pathological character of the disease is its power of *misappropriating* the proximate principles of food required for the nutrition of the body and the production of animal heat, converting them into an unassimilable substance incapable of oxidation—namely, diabetic sugar, which is cast out of the system by the kidneys as a useless and injurious foreign substance.

At first there is only a *partial* malassimilation of starchy and saccharine substances, but this becomes *complete* as the disease advances. Next comes a period when the fatty matter of the food is likewise converted into sugar; and when this stage of the disease is fully developed the whole of the carbonaceous alimentary principles are misapplied, instead of being assimilated and undergoing their normal metamorphic changes. Consequently they are not oxidised, and the temperature of the body falls below the healthy standard. Unfortunately this is not all, for if the disease runs its course unchecked it passes into a much more serious phase of its progress, and the albuminous or nitrogenous principles of the food also begin to contribute to the formation of diabetic sugar, and in quantity gradually increasing as the disease advances towards its termination, until a very small proportion is left to nourish the tissues and maintain the heat of the body. Thus, Professor

Greisinger found, by careful experiment on a diabetic patient restricted to rigorous meat diet, that only *two-fifths* of the whole of the albumen consumed in the food remained available for the purpose of nutrition, the rest being converted into diabetic sugar. But this does not even represent the full extent of the malassimilation of albumen in very advanced cases.

These data supply a ready and intelligible explanation of the gradually increasing and at length extreme emaciation observed in diabetics, accompanied, *not* by pyrexia, but an abnormally low temperature of the body, the latter condition being due to the complete absence from the blood of the oxidisable products of the assimilation of the carbonaceous principles of the food, and the great deficiency of those derived from the albuminous. Hence we can readily understand the fact shown by the recent investigations of Pettenkofer and Voit, that in diabetes there is a diminished consumption of oxygen, and a correspondently decreased production of carbonic acid by the process of respiration.

I have already referred to the necessity on the part of diabetics to refrain from starchy and saccharine articles of food, in order to prevent a return of the disease after recovery. The prohibition of bread from the regimen thus prescribed is generally complained of as the greatest hardship to be endured; consequently, various substitutes have from time to time been invented. Thus we have the gluten bread first suggested by Bouchardat, and the bran biscuits made according to different formulæ; the former, however, is insipid and unpalatable, while the latter, when free from starch, are composed entirely of *lignine*, and, therefore, contain no nutriment whatever. To obviate these serious objections, it struck me that a very important end would be gained if a kind of diabetic bread could be manufactured consisting of an admixture of gluten and bran. I therefore communicated with Mr. Van Abbott, of Princes-street, Cavendish-square, on the subject, and he has succeeded in getting manufactured in France, after much difficulty, a bread consisting of 80 per cent. of gluten and 20 per cent. of bran nearly free fron starch, and a very small quantity of butter. This bread is a much closer approximation to ordinary brown bread than any other substitute now in use. It is not only agreeable and palatable to the patient, as well as nutritious on account of the large proportion of gluten, but, what is also very important, it excites the peristaltic action of the bowels, and prevents or corrects constipation in consequence of the *lignine* it contains in the form of bran. I have no hesitation in saying that this bread is much superior to any other form hitherto produced for the use of diabetics.

In closing this series of contributions, I may state that I have conducted some experiments with lactic acid in the treatment of diabetes, but find it possesses no specific action on the disease apart from the strict animal regimen in conjunction with which it is administered. I intend at a future period to publish my experience on this subject.—*Lancet, Jan.* 11 *and* 18, 1873, *pp.* 45, 86.

29.—ON THE PATHOLOGY AND DIAGNOSIS OF ACUTE BRIGHT'S DISEASE.

By Dr. GEORGE JOHNSON, F.R.S., Physician to King's College Hospital.

While acute Bright's disease is usually associated with a more or less copious epithelial desquamation, there may be no desquamation of renal epithelium, and either no tube-casts or only small hyaline casts in the urine; while in other cases, either with or without epithelial casts, there may be casts crowded with small exudation-cells. The appearances which I have described are sharply defined in some cases, while in others they gradually merge into each other. Epithelial casts and desquamation may be abundant or entirely absent, or present in moderate amount. The casts with exudation cells may be numerous and unassociated with epithelial casts, or the two forms of tube-casts may be combined with and replace each other in variable proportions. It is certainly interesting, and, I think, of some practical importance, to note these different appearances in the urine.

In all the cases of acute Bright's disease to which I have hitherto referred, although the microscopical appearances in the urine are various, the general symptoms and the physical and chemical characters of the secretion are alike, and in particular the presence of a large amount of albumen is a constant phenomenon. Now, I have to tell you that we sometimes, though rarely, meet with cases of acute general dropsy in which the urine, although scanty, contains not a trace of albumen. In the great majority of cases acute Bright's disease and acute albuminuria are synonymous terms; but in these few exceptional cases the latter term is inapplicable, for the urine is not albuminous. Dr. Blackall described two cases of acute general dropsy after scarlet fever, in which the urine was not coagulable either by heat or by nitric, or, as he calls it, "nitrous" acid (*op. cit.*, p. 12 to 21). Dr. Roberts gives the history of two cases after scarlet fever, both fatal—one acute, the other chronic (On Urinary and Renal Diseases, pp. 24 and 400). Dr. Basham has recorded the case of an adult in whom

general dropsy followed exposure to wet and cold. He recovered (Lancet, August 1867). And I have notes of four cases that have come under my own observation. Three of these cases recovered, and the fourth was improving when he was lost sight of. In two of my cases the dropsy followed scarlet fever, and in the other two it was probably a result of exposure to cold. In two of the cases neither albumen nor tube-casts could be discovered throughout; in one a trace of albumen was found on one occasion; and in the fourth, after general dropsy had existed for six weeks without albumen or tube-casts, a trace of albumen and some hyaline casts appeared.

Now what is the explanation of these rare, remarkable, and exceptional cases? I have neither seen nor heard of any satisfactory explanation of them, and I am not prepared to give you one; but I venture upon one or two suggestions and queries. There is reason to believe that suppressed action of the skin is a powerful concurring cause of the dropsy which is associated with albuminuria; and this, perhaps, is the explanation of the frequent association of dropsy with the renal disease which results from scarlet fever or from exposure to cold and wet. In both these classes of cases the functions of the skin must obviously be more or less impaired—in the one by the specific inflammation, and in the other by cold; whereas diphtheritic albuminuria, without implication of the skin in the morbid process, rarely, if ever, gives rise to general dropsy. Then the question arises, Is it possible that suppression of the cutaneous secretion may alone cause acute general dropsy without the implication of the kidneys? May acute general dropsy result from a metastasis of the perspiration from the skin to the areolar tissue and the serous membranes? And may the scanty secretion of urine in these exceptional cases be a result of the morbid transfer of water to the tissues where the dropsical effusion takes place, as, by a reversed action, the perspiration is checked and the skin of a diabetic patient rendered dry by the copious flux of liquid through the kidneys? I am not prepared to answer these questions. In most cases of acute dropsy without albuminuria the urine has been scanty and high coloured. In one of Dr. Roberts's cases the urine was scanty almost to suppression, only two drachms having been voided in twenty-four hours; "it contained casts, but not a trace of albumen." The form of tube-casts is not mentioned. The total quantity of urine voided during the last seven days of life amounted to between six and seven ounces. No autopsy was permitted. In the second case the urine contained neither albumen nor casts, but it was scanty and high coloured; and, death having occurred after an illness of five months, "the kidneys were found to be good examples of the smooth white

Bright's kidney." In this case it would seem that, although there was no albuminuria, there was some structural change in the kidneys. Dr. Wilks has published in the sixth volume of the Pathological Transactions a remarkable case of general dropsy, with a peculiar form of renal disease, but without albuminuria, in a woman aged 35. The urine passed amounted to about twelve ounces in the day, of specific gravity 1012, and not albuminous. A few days before death the urine became less in quantity, and for the last four days none was obtained. The kidneys were pale and large, their combined weight being seventeen ounces. The cortical portion was seen by the naked eye to be scattered over with small round dots like grains of sand. On a microscopic examination these were found to be the Malpighian bodies, the capillaries of which were covered over with mulberry-like masses of oil-globules, while the tubes were healthy.

It may hereafter happen to some of you to have the opportunity of throwing additional light upon the pathology of these rare and exceptional cases of general dropsy not dependent on heart-disease and unassociated with albuminuria.

We have seen that the chief varieties and modifications of acute Bright's disease with albuminuria are the following:— 1, with epithelial desquamation (desquamative nephritis); 2, without desquamation, either with or without small hyaline casts; 3, with exudation-cell casts, either with or without epithelial casts and desquamation. Lastly, we have, as an entirely distinct class of cases, rare, exceptional, and obscure in their pathology, acute Bright's disease, or at any rate acute general and febrile dropsy, without albuminuria.

Changes in the Blood.—The effect of acute Bright's disease is not only to cause an admixture of blood-constituents with the urine, but also to bring about a large accumulation of urinary materials in the blood. While the urine is usually more or less bloody, the blood becomes in a greater or less degree urinous. Dr. Christison was the first to announce the fact that the blood in these cases contains a large amount of urea, and that urea is found in the dropsical and inflammatory effusions (Edinburgh Medical and Surgical Journal, October 1829). Not only is the blood altered by an accumulation of urinary materials, but also by a loss of its own normal constituents. The density of the serum is reduced from 1030 or 1031 to 1022 or even 1020. The loss of density is greatest when the urine has been most albuminous; and it is probably explained by the escape of serum through the kidneys. The hæmoglobin or colouring matter also diminishes rapidly, the normal proportion being 1,335 in 10,000. Dr. Christison found it reduced, after a few weeks' illness, as low as 955 in one case, in another to 564; and in a

young man ill for three months and a half subsequent to scarlet fever, who had never been bled before, it was only 427. At the commencement of the disease the loss of colouring matter is less rapid than the extreme pallor of the patient would seem to indicate; and it is probable that the blanched appearance of the skin is partly occasioned by the quantity of water in the subcutaneous tissue.

Etiology.—Acute Bright's disease may occur at all ages from infancy to extreme old age. The two most frequent causes of acute Bright's disease with dropsy are exposure to wet and cold and scarlet fever. Either of these causes is alone sufficient to excite the disease; but their combined action—exposure to cold during the progress of scarlet fever—is a most powerful determining cause of the malady. Diphtheria is a frequent cause of albuminuria; but, as I have before said, diphtheritic albuminuria is rarely associated with dropsy. Amongst the less frequent causes of acute albuminuria are measles, erysipelas, pyæmia, the absorption of poisonous materials from the uterus after parturition, rheumatic fever, the malarious poison, typhus and typhoid fever, cholera, and, lastly, excessive eating and drinking, more especially when combined with dyspepsia. In the majority of cases acute albuminuria, resulting from other causes than scarlet fever and exposure to cold, is unassociated with dropsy, and its history belongs to that of the disease with which it is associated as a complication. We shall find hereafter that albuminuria resulting from one or other of the various causes here referred to sometimes leads to a chronic and incurable degeneration of the kidney. Excess of alcohol is a more frequent cause of chronic than of acute Bright's disease. A remarkable case of transient alcoholic albuminuria occurred when Dr. Baxter was house-physician to our hospital. A man between twenty and thirty years of age was brought in one night by the police. He was unconscious, and breathing stertorously. He was believed to be drunk, and a large quantity of vinous liquor was pumped out of his stomach. The unconsciousness remaining, uræmia was suspected, and some urine drawn off with the catheter was "loaded with albumen." He was then put into bed, cupped over the loins, and a purgative given. When Dr. Baxter visited the ward in the morning he found the man sitting up and clamouring for his discharge. He said that he had been very drunk over-night, but now he had nothing the matter with him. He passed some urine, which was found of normal colour and specific gravity, and without a trace of albumen. He then left the hospital in triumph. The temporary albuminuria was the result of renal congestion while the excess of alcohol was being excreted by the kidneys.

Diagnosis.—In most cases of acute Bright's disease the symptoms are so obvious, that the disease can scarcely be overlooked or mistaken for any other. The only cases in which there is a possibility of acute albuminuria being unrecognised are those in which it is unassociated with dropsy. But, the existence of albuminuria being discovered, it is not always easy to determine whether this is the result of a recent acute attack, or of a chronic degeneration of the kidney. We shall be in a better position to discuss this important practical question after we have studied the various forms of chronic Bright's disease. Meanwhile, however, I may tell you that, as a rule, high coloured, smoky, and blood-tinged urine, of high specific gravity, is an indication of a recent acute attack; and equally so is a copious sediment composed of epithelial and blood-casts, or of exudation-cell casts, alone or mixed with epithelial casts. The appearance of oily casts and cells, in combination with numerous epithelial casts, does not materially affect the diagnosis. On the other hand, urine of low specific gravity and very pale in colour, yet highly albuminous, is usually evidence of chronic disease; and this evidence is strengthened by the appearance of numerous oily casts and cells unassociated with epithelial or exudation-cell casts. Large hyaline casts in *pale* highly albuminous urine point to disease not only chronic, but in an advanced stage. We shall return to this subject, and discuss it more fully in a future lecture.

Prognosis.—Acute Bright's disease has a tendency to terminate in complete recovery. It is essentially a curable disease, as much so as acute bronchitis or acute pneumonia. The earlier the patient comes under treatment the better is his prospect of recovery; and, on the other hand, the longer the symptoms have continued without signs of amendment, the more grave does the prognosis become. The prognosis is, on the whole, more favourable in the young and middle-aged than in those more advanced in years; but the disease may prove mild and tractable even in very aged persons. For obvious reasons, the prospect of recovery is better in the case of those who can avoid exposure to cold and other injurious influences, than when the patients' circumstances are less favourable.

In favourable cases a copious secretion of urine, of comparatively low specific gravity and of paler colour, with a diminishing amount of albumen and decrease of dropsy, are amongst the earliest signs of amendment. Albuminuria is usually the last symptom to disappear. The time of its disappearance varies, in different cases of recovery, from a few days to many months. If the urine continue albuminous for more than six months, it becomes more and more doubtful whether it will ever cease to be so; but I have seen cases of complete recovery

after albuminuria had continued for one, two, and even three years. So long as the urine continues albuminous, in however slight a degree, although the dropsy and all other general symptoms may have passed away, recovery must be considered incomplete. Acute Bright's disease, although, as a rule, a curable, is not unfrequently a fatal disease. There are some symptoms and complications which indicate a case of more than ordinary peril; such as a very scanty secretion of highly albuminous urine; frequent and distressing vomiting; great anasarca, with a tendency to erysipelatous inflammation of the skin; dropsical effusion within the chest, either in the pleura or the pericardium, or both, with urgent dyspnœa; inflammation of the lung, or pleura, or pericardium, or endocardium; severe and persistent headache, which is apt to be followed by convulsions and by coma, with a brown and dry tongue. All these are symptoms of grave, though not always of fatal import. When the renal disease is acute, and therefore essentially curable, recovery sometimes occurs after the most formidable symptoms of uræmic poisoning have been present.

A consideration of the exciting causes of the renal disease forms an element in the prognostic indications. When Bright's disease results from some inherent constitutional defect, without obvious exciting cause, it is generally more intractable than when it is directly due to exposure to cold or to the influence of some specific blood-poison, as, for instance, that of scarlet fever or erysipelas. To all general rules of this kind there are exceptions, and each case requires a separate and careful study.

Let me impress upon you one point of practical importance. Before you pronounce a patient to be entirely free from his malady, be careful to test the urine, not only after rest and fasting—*i.e.*, in the morning before breakfast—but after food and exercise. Albuminous urine is usually more copiously so after food and exercise; and you will sometimes find that, while the urine before breakfast is quite free from albumen that which is secreted after a meal is decidedly and even copiously albuminous. In some cases exercise has even more influence than food in exciting renal congestion and albuminuria.

An attack of acute Bright's disease confers no immunity from future attacks; on the contrary, the disease may occur more than once in the same subject, a result of either inexplicable predisposition, or of a liability resulting from a first attack. I think my experience warrants the statement that when acute albuminuria has resulted from some non-specific cause, such as exposure to cold and wet, or excessive eating and drinking, it is more likely to recur than when it has been excited by a specific morbid poison, such as that of scarlet fever, which, as

a rule, does not occur a second time in the same individual; but I have known patients so unfortunate as to have two attacks of scarlet fever, and each attack complicated with albuminuria. —*British Medical Journal, Feb.* 1, 1873, *p.* 109.

30.—DIGITALIS IN DROPSY.

[A correspondent of the Medical Times and Gazette says :]

I am induced to send you the following in hopes that others may follow my example, especially with regard to the uses of the same remedy. The value of digitalis in certain forms of dropsy is well known, and I would hardly venture to put before you the following notes were it not for the plans adopted for employing this remedy.

A woman of middle age was brought to the hospital after she had been confined to bed for some time for dropsy. According to her own statement she had passed no urine for forty-eight hours previous to admission; certain it is that in eighteen hours after admission only eight ounces could be got away by the catheter. There was a good deal of dropsical effusion under the skin in various parts, especially in the walls of the abdomen and in the breasts. The urine was highly albuminous when tested after withdrawal by catheter. Under the circumstances it was necessary to get the kidneys to act, and I ordered to be applied to her loins, over the kidneys, an ounce of the tincture of digitalis on a piece of lint, to be covered over carefully, and to be renewed in four hours. The result was most satisfactory: urine began to flow profusely, and before long far exceeded the normal quantity. Had it been possible to procure the fresh leaves, I should of course have used them, but they were not to be had.

The other instance is a man with contracted kidneys and no dropsy, who from time to time becomes drowsy, and subject to fearful convulsions. In his case, too, nothing suits so well as digitalis; but when he becomes insensible, the very time he ought to take it, it cannot be given. Under such circumstances I commonly reduce a quarter of a grain of extract of digitalis with water, and inject it under the skin of the arm. This, as a rule, makes the urine flow freely, and the patient gradually comes round.—*Medical Times and Gazette, Jan.* 1873, *p.* 71.

31.—ALCOHOL AS A CAUSE OF RENAL DISEASE.

By Dr. W. H. Dickinson, Senior Assistant Physician to St. George's Hospital, &c.

[The question discussed in this paper is whether the abuse of alcohol really ranks so high as a cause of renal disease as has

generally been supposed. As an instance of the prevalence of the opinion that alcohol does so act, the following sentence occurs in the recent work on renal disease by Dr. William Roberts, of Manchester—"The abuse of spirituous liqnors ranks high—probably higher than any other single circumstance—as a determining cause of Bright's disease." The result of more close investigation of the subject, however, is that alcoholism does not increase renal disease, however it affects other organs. Dr. Dickinson gives in a tabular form "An Analysis of the state of the Kidney, as found after Death, in 149 persons following Alcoholic Trades, and in the same number of persons circumstanced otherwise;" to which another table is appended. showing how often symptoms were observed pointing to the kidney. He says:]

It will be at once seen that the kidney in the two classes shows no great disparity—a disparity far less than is exhibited by other organs. The total of kidney-disease is not increased by the alcoholic trades. The uniform changes of cortex which tend to albuminuria were slightly, and but slightly, more frequent under liquor, occurring in 86 persons of the alcoholic to 82 of the opposite series. The most marked increase under alcohol was with kidneys described as enlarged and congested, or large and coarse, conditions often undeclared during life. Granulation was also increased, but not to the same extent as cirrhosis, its hepatic analogue. Associated with, but not entirely dependent upon, this increase, there was also under alcohol a marked preponderance of cerebral apoplexy and hypertrophy of the heart, results of vascular deterioration.

Under the same influence of alcoholic trade, the "large, smooth, mottled kidney" (a description which may refer either to advanced tubal nephritis or to lardaceous infiltration) was diminished, as also was the lardaceous change of a distinctly recognisable sort. Thus the more rapid and obvious forms of renal disorder were in abeyance. Such increase as occurred was insidious and latent—rather exposed after death than traceable during life. Dropsy, external or internal, discovered albuminuria, and death directly attributable to the kidneys, were less frequent with liquor than without. Cerebral uræmia, the natural ending of granular degeneration, preponderated on the other side.

In deducing the effects of alcohol from this comparison, it is necessary to allow for the somewhat lessened exposure to weather, and also to accidental violence, involved in the alcoholic pursuits—exemptions which, so far as they go, would diminish the liability to tubal nephritis and to lardaceous change. This may help to explain the comparative rarity of

these disorders with the alcoholic class. The increase in fibroid and chronic tubal changes must be referred to the liquor alone; but this increase is not great.

Taking all facts together, I do not see how it can be doubted that the effects of alcohol in causing renal disease is less than used to be asserted: that this agent does not rank higher, but lower, than other circumstances—to wit, external temperature and the absorption of lead—as a determining cause of Bright's disease. Although we can now and then trace the existence or aggravation of renal symptoms to intemperance, we do so with far less frequency than with disorders which have other sites. Pathological and clinical evidence combine to show that the evil influence tells more upon the nervous system, the liver, the blood-vessels, and probably in the production of tuberculosis, than upon the kidneys. The facts adduced are consistent with those formerly advanced, and with the quoted conclusions which have been the object of attack.—*British Medical Journal, Nov.* 23, 1872, *p.* 575.

SURGERY.

FRACTURES, DISLOCATIONS, AND DISEASES OF THE BONES, JOINTS, &c.

32.—ON COLLES' FRACTURE OF THE RADIUS, AND ITS TREATMENT.

By Dr. J. ALEXANDER MACDONALD, Belfast.

[Few fractures have had so many ingenious splints devised for their treatment; yet, in spite of the utmost care, many cases of this fracture turn out unsatisfactorily. Its true pathology was unknown until 1814 when it was described by the eminent surgeon whose name it bears. Previously it had been mistaken for dislocation of the wrist backwards. In 1850 Dr. R. W. Smith, of Dublin, published his treatise on fractures in the vicinity of joints. Dr. Gordon's mode of treatment by his splint was published in 1861. (*Retrospect*, vol. xliv., p. 97).]

The seat of the fracture is about an inch above the styloid process, and generally transverse; occasionally, however, presenting some degree of obliquity in its course, either downwards and inwards or downwards and outwards.

Referring to the bones of the forearm as they appear *in situ*, we observe the normal concavity of the radius anteriorly; the direction of its carpal extremity forwards and inwards; and the difference in length between its anterior and posterior surfaces, amounting, on an average of specimens, to nearly half an inch.

On the occurrence of the accident, we have the following results; viz., the natural concavity of the radius is lost; its distal extremity, with the carpus attached (in consequence of the unopposed action of the supinator and long extensors) is carried backwards, outwards, and upwards; while the length of the bone anteriorly is augmented in a ratio corresponding to the interval between the fragments, and the interosseous space diminished by the approximation of the upper fragment towards the ulna by the pronator quadratus.

Accepting the above as the pathological conditions presented to us, we have to consider by what means we may best obviate them in endeavouring, first, to restore the form of the radius;

second, to bring back its carpal extremity to its proper aspect, *forwards and inwards;* and, thirdly (as a consequence of the preceding steps), to remove the obstacles to the reunion of the opposed surfaces, and, if possible, secure the normal length of the bone (radius) before and behind. How difficult of accomplishment this last point is, may be inferred from Dr. R. W. Smith's testimony that, out of twenty cases of fracture of the lower end of the radius, in none had the normal length been restored; in all, the anterior surface exceeded the posterior. These several desiderata have been met by the apparatus known as Gordon's splint, in which the normal curve of the bone is taken as a guide, and the radius thereby forced to assume its proper form and relations; while the carpal surface is directed downwards, the hand being moderately adducted, and midway between pronation and supination finally. They are easy of application; and the feeling of comfort experienced from the support thereby afforded is marked, when contrasted with any other form of splint in ordinary use. To them the motto "Cito, tuto, et jucundè," seems especially applicable; and by their employment the *opprobria* of stiffness, &c., are almost entirely unknown. For additional testimony to their value since Dr. Gordon's paper first appeared in the Dublin Medical Journal in 1865, I would refer to a communication to the Medical Times and Gazette in the year following by Mr. Lawson Tait, by whom they were again brought under the notice of the profession. (*Retrospect*, vol. liii, p. 165.) In a recent letter to me, he repeats his favourable opinion, fortified by increased observation of more than fifty successful cases, and the too frequently unsatisfactory results of ordinary treatment.

The splints are made by Sloan, Israel Street, Belfast.—*British Medical Journal, March* 1, 1873, *p.* 223.

33.—ON A NEW METHOD OF EXCISING THE ELBOW-JOINT IN CASES OF ANCHYLOSIS.

By Thomas Annandale, Esq., F.R.S.E., Surgeon to the Edinburgh Infirmary, and Lecturer on Clinical Surgery.

The importance of disturbing as little as possible the attachments of the muscles in excising the elbow-joint is one of the recognised principles of the operation. In cases of extensive disease of the joint, a free exposure and removal of the affected surfaces are necessary; but in cases of anchylosis without actual disease, such free exposure and removal are not, in my opinion, required; and are, therefore, liable to the objection that they necessitate more division of the surrounding muscular connexions than is absolutely essential. The very satisfactory

results I have obtained in several cases of compound fracture or dislocation of the lower end of the humerus by the "primary" removal of the injured bone and the tip of the olecranon, without interference with the head of the ulna or radius, have led me to this latter opinion; and I therefore think that in many cases of anchylosis of the elbow-joint, the removal of only a portion of the lower extremity of the humerus, together with any new osseous material likely to interfere with the future mobility of the joint, will be more likely to afford a satisfactory result as regards the usefulness of the arm. If this principle is correct, it has the great advantage that it leaves the attachments of the important muscles connected with the olecranon, coronoid process, and the head of the radius uninterfered with, and is, therefore, certain to make the operation more complete in its results. It is well known that a limited removal of the bones in excision of the elbow-joint is often followed by unfavourable results as regards the mobility of the new joint; but as such bad results usually depend in great measure upon a gradual contraction or shortening of the surrounding muscles and other soft textures, in consequence of their free division during the operation, it seems to me that a less free division of these textures will limit such contraction, and thus make it unnecessary to remove so great an amount of bone. This remark can, of course, only apply to cases where disease is absent or very limited.

Having lately to perform excision of this joint in a case of anchylosis following an old-standing injury, I endeavoured to carry out the principle advanced by performing the operation in a manner which, so far as I am aware, has not previously been suggested.

Two lateral incisions, about four inches in length, having their centres opposite the middle third of the olecranon, were first made on the posterior aspect of the joint, and the internal incision running parallel and a few lines external to the ulnar nerve, the external one running in the same direction and a little internal to the prominence of the external condyle. The ulnar nerve, together with the skin and other textures around it, was then carefully separated from its position, and drawn inwards by means of a blunt hook, and the exposure of the bones connected with the joint continued, partly from the internal and partly from the external incision, by dissection, the knife being kept close to the periosteum. In this way the muscles and other soft textures were together separated from the lower end of the humerus and condyles, the attachment of the triceps brachialis anticus and biceps muscles being left untouched. The tip of the olecranon was next removed, the ligaments of the joint, some fibrous adhesions and new osseous

material divided, and, a copper spatula having been passed between the anterior aspect of the joint and the separated textures, the lower end of the humerus was sawn through with a narrow saw, and removed together with its condyles. As the head of the radius did not move freely at its articulation with the ulna, owing to some strong adhesions, the knife was carried round it so as to divide these bands, and a thin slice of its articular surface was sawn off. The removal with the bone forceps of some small portions of new osseous material completed the operation. Two or three small arteries were ligatured, and the edges of the wound brought together in the usual way.

In this operation no attempt was made to save the periosteum, because the subperiosteal method of excising the elbow-joint is not, in my opinion, advisable; the formation of too much new osseous matter making its results, as regards the mobility of the parts, unsatisfactory in many cases.

Should I require to operate in a case where the anchylosis was more completely osseous, I would, after separating the soft parts in the way described, introduce the narrow saw under the triceps muscle close to its insertion into the olecranon, saw completely through the anchylosed joint, and then remove as much of the lower end of the humerus as seemed necessary. If the radius and ulna still remained fixed together, I should endeavour to separate and free them without interfering with the olecranon or coronoid processes or their representatives, should they have been destroyed or obscured in the progress of the case.—*Lancet, Dec.* 21, 1872, *p.* 877.

34.—ON SOME OF THE MORE RECENT METHODS OF TREATING WOUNDS ON ANTISEPTIC PRINCIPLES.

By David J. Hamilton, Esq., Junior House-Surgeon, Northern Hospital, Liverpool; formerly Resident-Surgeon to the Royal Infirmary, Edinburgh.

[It is difficult for those not in connection with a large hospital to keep informed as to the progress of antiseptic surgery.]

The following short and merely practical remarks were gathered from the observation of a large number of cases, not all successful cases, but, when unsuccessful, the failure could generally be traced to some cause. A good many of them have been treated in the Royal Infirmary, and Chalmers Hospital, Edinburgh. The others were cases which were treated in various English Hospitals. A large number of them were under the charge of Dr. Patrick Heron Watson, whose exceed-

ing surgical care and skill in the treatment I would beg respectfully to remember.

So far, it seems there are two objects to be kept in view, as guides to success in the antiseptic treatment of wounds,

1st. To prevent putrefaction.

2nd. To abstain, as much as possible, from applying any irritant to an open surface.

So long as we maintain these two conditions, a certain train of phenomena occurs which entirely differs from that which follows when putrefaction or irritation has been set up.

If the wound goes wrong, then there must be some cause for this, and it is only by diligent research and minute observation that we can hope to discover the cause, and institute the remedy. The prevailing tendency of modern observation on the subject of putrefaction seems to be more and more towards the germ theory of its origin; and certainly, in practice, every fact seems to point to this as by far the most probable cause; so much so, that it is almost impossible for a surgeon to conduct an antiseptic system of surgery without having the germ theory constantly before his eyes. Carbolic acid is by far the most serviceable antiseptic, on account of its great power and its volatility. It is, however, a powerful irritant, and should never come in contact with an open surface in a strong solution, or otherwise. We ought rather to insure that no atmospheric air comes in contact with the part which has not previously passed through a medium of the antiseptic. In fact, our object should be to place the wound in similar conditions to one inflicted subcutaneously.

The signs of a wound being kept antiseptically, are very well marked, and are the following:—

a. There is no putrefactive odour, and acetate of lead test paper is not blackened by the discharge.

b. The edges have no inflammatory blush, and are of their natural colour and dimensions.

c. Little or no discharge.

d. Pulse and temperature are normal, and there is no inflammatory pain.

e. Parts generally glued together, on the third day, with thickened lymph.

When a wound putrefies, it will generally be found that the putrefaction commences in the serous discharge which has soaked through the dressing during the first twenty-four hours, and that this putrefaction afterwards spreads to the wound itself. When putrefaction has once taken place in a wound, carbolic acid will never restore it to the state in which it would have been had it not putrefied; and, if used in strong solution to destroy putrefactive odour, it is a most dangerous applica-

tion. Several reports have lately been published, giving accounts of mysterious cases of what was said to be tetanus following in a few hours after the application of pure carbolic acid to an open surface. There is little doubt that the great majority of these cases were instances of carbolic acid poisoning from absorption. Having seen some very suspicious cases of this kind, in which the patient died, or became seriously ill, in a short time after its application, I was led to make some experiments on the subject, and found that from five to ten grains of carbolic acid, injected subcutaneously, or put into an incision in the skin of a large rabbit or cat, were sufficient to kill them in from one and a half to two hours. The animals were first affected, in about five minutes after the application, with slight spasms in the limbs, which became excessive in about half an hour; and, finally, they died in a state of coma. I have seen patients affected in exactly the same way, after its use for too long a time, or in too concentrated a form. If the urine of such a patient be examined, it is smoky *when passed;* and, on standing for three days, becomes perfectly *black.* It contains carbolic acid, and the smoky appearance is not due to the presence of blood. A convenient test for carbolic acid in solution is the following:—Add a few drops of a solution of a persalt of iron, and a mauve colour is produced, which is soluble on the addition of nitric acid. The colour is best seen, when in small quantity, by placing the glass vessel on a piece of white paper, and looking at it from above downwards. It is a very delicate test, giving an indication with one part of carbolic acid in two thousand four hundred of water. I have obtained this reaction in the urine of a patient suffering from carbolic acid poisoning, caused by absorption from a wound.

In order to prevent the putrefaction of the serous discharge during the first three days after the operation or injury, several means have been adopted; carbolised cotton and carbolised muslin have been used, and these serve the purpose to a certain extent. Still in the case of carbolised cotton, bagging of the discharge is apt to occur at one part, and so tax the powers of the antiseptic too much at this particular part, making the risk of putrefaction greater than it would be were the discharge more equally distributed through a large space. What is far superior to these is "tenax," or fine picked oakum; the former is preferable, and it is of uniform strength. In order to act as an antiseptic, it must be put on in *a thick pad* all round the part, instead of the usual thin layer used for dressing purposes. This has the advantage over carbolised cotton, of allowing the discharge to soak slowly, and prevents bagging at any one part. At the same time it is, to a certain

extent, waterproof, and does not allow the discharge to soak through too quickly. Its antiseptic powers are also quite sufficient to prevent putrefaction for twenty-four hours; and the volatile constituents are prevented from being dissapated too soon by the resins of the tar it contains, which offer a certain amount of resistance to evaporation, in the same way as the solid paraffin does in Mr. Lund's carbolised gauze. It is also very cheap, so that the objection to antiseptic surgery being an expensive mode of treatment, does not hold good in this instance. There is a certain objection to using it, for some parts, on account of its bulk, and to avoid this "antiseptic calico" will be found to be very useful. It is made in the following way: One ounce of wood tar is dissolved in eight ounces of methylated spirit; this thin solution is then *brushed* over thin calico or muslin, previously cleansed from any flour or starch which they contain. The best calico for the purpose is what is known as "jaconet," and the muslin should not be too open, and must be soft in fibre. After the calico or muslin has been coated over in this manner, it is pressed with a weight, of from thirty to forty pounds, so as to drive out any superabundant spirit, and thoroughly to saturate the texture in every part. It is then hung up to dry in a current of dry air, and not exposed to the direct rays of the sun. It is now ready for use, and in this state ought not to soil the fingers, and should be perfectly soft and pliable. When this "antiseptic calico" is employed as an external dressing, it ought to be wrapped round the part in several layers. Supposing the case to be one of amputation, the following rules have seemed to me to be important guides to success.

Make certain that the instruments, lotion pots, sponges, &c., contain no organic matter. This is most important, and neglect of this is a common cause of failure. The sponges ought either to be quite new, or ought to be cleansed by first putting them into a weak solution of ammonia, then in a weak solution of nitric acid, and, lastly, in a solution of carbolic acid. As an additional precaution, they should be put in a solution of permanganate of potash, as a test for organic matter. They ought not to be entrusted to nurses and *never* to be used again, if, by any means, they have come in contact with purulent or putrefactive discharge. Wash the limb or other part with a solution of carbolic acid in water, before operation, and shave away any hair from the neighbourhood. Use the carbolic acid spray apparatus during the operation; the strength of the solution employed being 1 to 100. See that nothing in the shape of cotton fibre, or organic texture of any kind, unless rendered antiseptic, comes near the wound during operation. Use carbolised catgut ligatures and silver wire sutures, the one

soaked in carbolic oil, the other dipped in carbolic lotion, and see that no organic matter adheres to the needle or wire. Stitch the wound up *closely*, leaving an opening at the most dependent part, large enough to admit the nozzle of a syringe. Cover the wound with a strip of xylonite tissue, soaked in carbolic lotion. This xylonite tissue contains a certain amount of camphor, which, along with the small amount of carbolic acid contained in the solution, renders it quite antiseptic. It acts as an excellent "protective covering," is quite waterproof, and exceedingly cheap. As long as there is much serous oozing, that is to say, during the first three days, the "carbolic lac plaster" does no harm. It is when it is kept on for a longer period that it causes irritation, and retards the healing of the wound, and should be given over in favour of a milder preparation. So long as it does not come actually in contact with the open surface, there is no harm done for three or four days, and, in a great many cases, an antiseptic of this strength is absolutely necessary during this time. After the serous oozing has ceased, then the greatest danger of putrefaction setting in is over, and there is no necessity for such a strong preparation as the carbolic lac.

Having put on a piece of the carbolic lac plaster, overlapping the wound for three or four inches, we next wrap round it something to soak up the bloody serum likely to escape from under the plaster. For this purpose carbolic gauze may be used in several layers; but what I have found better is a pad of tenax, put all round the limb in *large* quantity, and especially at the most dependent part. Or, if this cannot be conveniently applied, antiseptic calico may be substituted, always taking care that it be in large quantity. I have not found the practice of putting a piece of waterproof tissue between the outer layers to be attended with good results. It keeps the part damp, and hence furnishes one of the elements for the putrefactive process. It is much better to employ some bulky substance, such as tenax, which is to a certain extent waterproof, but allows the vapour to escape through its substance. At the same time, it acts as a compressing agent, and prevents blood oozing in too great quantity. Put a tight bandage round the part, and this bandage ought in certain cases to be made of antiseptic calico.

How often should the dressing be changed?

If there is much serous oozing, change the dressing every twelve hours, or oftener; if there is not, leave it for twenty-four hours, but not longer. In changing the dressings, use the greatest caution. Never expose the wound unless under a spray or veil of carbolic acid solution. If there is much clotted blood in the wound, wash it out by syringing with carbolic

lotion (1 to 100). If there is not much clot, do not disturb it, but simply readjust the dressings, after the surrounding parts are carefully cleansed and dried. Touch the parts as little with the fingers as possible. Dress it again in twelve hours if necessary. Be guided in this by the amount of oozing. Having arrived at the third day, if the wound has been kept antiseptic, what we expect to find is the following:—There is no swelling, redness, or tension on the sutures; the edges are in intimate contact, and covered with thickened lymph; there is no pain on moderate pressure. The discharge, if any, is of a lymphy character, and contains a large quantity of desquamated epithelium in a softened condition. It generally contains abundance of germinal matter when of a lymphy character.

Now is the time for leaving off any strong preparation of carbolic acid, and applying a much weaker antiseptic, and one as little irritating as possible. For this purpose, antiseptic calico or tenax suit admirably, the wound being protected as before with a strip of xylonite tissue. They must be applied in large quantity, and so as to entirely surround the part. In a day or two the part contracts, and heals without any appearance of inflammation.

In compound fracture, the wound should be thoroughly washed out with a solution of carbolic acid, of the strength of 1 to 40. A piece of xylonite, or green protective tissue, cut a little larger than the wound, should then be soaked in the same lotion and placed over the wound. The limb should then be wrapped round with carbolic lac plaster, overlapping the wound for about two inches, and, over this, strips of antiseptic calico should be placed in several layers. A strong brass syringe should be used for washing out the wound, and a solution should be made forcibly to penetrate to every part, and to "float" out any foreign bodies which may have accidentally been admitted. The limb should then be laid on a splint, made, as far as practicable, of metal, and padded with tenax, The dressings ought to be changed in twenty-four hours, if there is any oozing, or before this, if necessary. If there has been any oozing into the padding of the splint, this should also be removed. In changing the dressings use the spray apparatus, or a veil of washed linen soaked in a solution of carbolic acid (1 to 100). Wash the wound and surrounding parts carefully with carbolic acid solution of this strength, and then, while the wound is covered with the veil, thoroughly *dry* the surrounding parts. Dress as before. On the following day there will probably be little or no oozing, and now it is only necessary to dress it with a protective covering, and several layers of antiseptic calico or tenax. In instances where the injury is severe,

and the wound large, it is necessary to continue the carbolic lac plaster for a longer time, as the danger of putrefaction is, of course, greater in that case. The greatest care must be taken in changing the dressings, to avoid having the wound exposed at any time, except under the carbolic acid spray, or covered with a veil. In treating scalp wounds and compound fracture of the skull, the hair should be closely shaved round the wound. Then the wound should be washed out carefully with the solution (1 to 40) of carbolic acid, so as to remove every vestige of foreign matter. The edges are then to be drawn into *intimate* contact with wire sutures. Over this a strip of protective tissue is placed, and, finally, a large pad of tenax, without any carbolic lac plaster, and this is fixed with a tight bandage. The dressing is to be changed on the following day, and the wound dressed in the same way. On the third day the wound will be a superficial scar, and can be dressed with tenax, without any protective covering, so as to form a scab. Scalp wounds, when treated properly in this way, *never* suppurate.

In treating granulating superficial wounds, the same principles hold good, only we must be especially careful never to allow carbolic acid, in strong solution, to come in contact with the wound. If we do so, the wound never heals, the carbolic acid seeming to act on the protoplasmic germinal centres, and to destroy their tissue-forming powers. If the ulcer is not irritated with carbolic acid, it will heal rapidly, provided putrefaction is prevented, and that there is sufficient tissue left to form a cicatrix. It ought to be washed with a solution of carbolic acid (1 to 100), then covered over with a piece of protective tissue, of the size of the wound. It should next be covered with several layers of antiseptic calico ; and if there is much discharge, a large pad of tenax should be placed at the most dependent part. This dressing ought to be changed every twelve hours if there is much discharge, or every twenty-four hours if this is moderate ; all the precautions which were recommended in changing the dressing of a compound fracture, being used in exactly the same manner in this case.

As regards the occurrence of pyæmia or erysipelas, I have never known a case of either the one or the other occur where the wound has been treated antiseptically ; in fact, taking the general run of cases in hospital, in the same wards, and under the same circumstances, the only examples of pyæmia, erysipelas, or diffuse suppuration I have seen, during the last three years, have been in patients who were not treated on antiseptic principles.—*Liverpool and Manchester Medical and Surgical Reports*, 1873, *p.* 140.

35.—ILLUSTRATIONS OF THE SURGICAL USES OF THE PNEUMATIC ASPIRATOR.

By T. R. Jessop, Esq., Surgeon to the Leeds General Infirmary, and Lecturer on Surgery at the Leeds School of Medicine.

[Medical practitioners in general are not fully alive to the great disadvantages which they labour under from the want of a thorough appreciation of the many and varied purposes which the aspirator has been found to fulfil. The instrument was invented by Dr. Georges Dieulafoy. Having repeatedly observed how unimportant a lesion is produced by the insertion of the fine nozzle of the hypodermic syringe, and also the impunity attending the introduction of acupuncture needles, even deeply, into the substance of important and highly organised structures, he conceived the idea of creating a vacuum in connection with a fine tubular needle, so as to exercise a powerful suction upon any fluid into which the needle should be introduced. This principle he embodied in his instrument, the pneumatic aspirator.]

As is the case with all inventions, many improvements have been made upon the original instrument. The one which I now show you is the latest issued by Messrs. Weiss and Son, of the Strand, London; and, in my judgment, it possesses decided advantages over all others which I have seen. It consists of a brass syringe, capable of holding five ounces of fluid, fitted with an air-tight screw-piston, and having its nozzle guarded by a tap. Attaching the nozzle to the bottom of the syringe is a short tube of glass, which enables the surgeon to ascertain the quality of the fluid as it passes into the body of the instrument. To one side of the instrument, in its whole length, is applied a fine hollow glass tube, which communicates at its lower extremity with the interior of the syringe, and is shut off from the external atmosphere, at its upper end, by means of a tap. This glass tube is marked at regular intervals in half-ounces, for the purpose of demonstrating the quantity of fluid contained in the syringe at any given time; and forms, besides, a means of exit, whereby the syringe can be emptied of its contents when, during an operation, it is desirable not to disengage the nozzle. Several tubular needles and trocars, some of which are of extremely fine calibre, made accurately to fit the nozzle of the syringe, either directly or through the medium of an elastic tube, complete the instrument.

In describing how to work the aspirator, I cannot do better than make use of Dr. Dieulafoy's own words, altered only so as to apply to the improved instrument. He says: "In order to produce a vacuum within the pump, it is necessary first to close the two taps, and then to screw up the piston. The vacuum is

thus obtained as a preliminary measure, and the operator is in possession of a powerful aspirator, ready to be used when the proper time arrives." "Let it be supposed that we wish to examine an effusion into the cavity of the pleura. The tubular needle No. 1 or No. 2 must first be introduced into an intercostal space; and, when it has penetrated the tissues for about a third of an inch, it must be connected with the pump in which the vacuum has been established, either directly or through the medium of a caoutchouc tube. This done—and to this point I desire to call special attention—the tap must be opened between the needle and the vacuum, and the needle pushed gently forward. We may thus slowly traverse the tissues, so to speak, with the vacuum in hand, until we discover the effusion. The eye of the operator should be directed to the short glass tube between the needle and the pump; and, at the moment when the needle enters the liquid, the latter rushes forcibly into the instrument. The diagnosis is at once complete, the manœuvre is absolutely harmless, and the desired object is attained."

Such is the method of employing the aspirator which I have myself usually adopted: and the directions here given apply to all cases, medical and surgical, in which its use is indicated, equally with the example selected by Dr. Dieulafoy for his description. As a precaution against the introduction of septic materials, I always take care that the needle or trocar has been dipped overhead in carbolised oil. I have said that in the aspirator we possess a valuable aid both to diagnosis and to treatment. I will now go on to make a few selections from the numerous cases in which I have resorted to its employment.

And first, I will speak of its use for purposes of diagnosis. There are few groups of diseases which present greater difficulties, or which tax the skill of the surgeon in a higher degree, than *abdominal tumours*. Not many of us can look back upon our experiences without calling to mind numerous instances in which grave mistakes have been made, leading to pernicious treatment, and destroying the confidence of our patients both in ourselves and in our science. That in the aspirator we possess a powerful means of elucidating some at least of these cases, is sufficiently shown by the following examples.

Case 1.—On August 30th last, a woman, aged 46, was admitted under my care into the Leeds General Infirmary with an abdominal tumour of twelve months' growth, and equal in size to a seven months' pregnancy. The tumour was somewhat fixed towards the pelvis; several hard movable nodules could be distinguished through the abdominal walls; it was doubtful whether fluctuation existed or not. The pelvis was

found, on vaginal examination, to be filled posteriorly by a firm mass, and the os uteri could not be felt, being apparently pushed above the pubes, high out of reach of the finger. Menstruation had for some years been very irregular. My colleagues examined the case with me, and we all felt doubtful as to its nature. On September 21st, aspiration was made through the abdominal walls with the result of extracting four ounces of a thick glutinous brown-coloured fluid, such as is found only in ovarian cysts. The nature of the disease having been thus established beyond doubt, a fortnight later I performed upon her the operation of ovariotomy.

Case 2.—One day last week it was intimated to me that Dr. Allbutt wished me, as his surgical colleague, to examine a patient in his ward, a married woman, aged 34, with a view to decide upon the propriety of recommending the operation of ovariotomy. The enlargement was first suspected early this year, and was attributed for some months to natural causes. I found the abdomen distended to about the size of a full pregnancy, by a round, centrally placed, smooth tumour, in which a not very distinct fluctuation could be felt. On vaginal examination, the os uteri was felt high up posteriorly, small, and round; the cervix had disappeared; no movement of the os could be detected by displacing the tumour from side to side; and a Simpson's sound introduced into the uterus showed the cavity of that organ to measure an inch and three-quarters only in depth. The central position, the shape, and the general character of the tumour, the absence of cervix uteri, the duration of the symptoms, taken together, were sufficient to throw a little doubt upon the true nature of the case. On appealing to the aspirator, however, the ovarian character of the tumour and the correctness of Dr. Allbutt's diagnosis were at once determined, by the extraction of a syringe-full of thick stringy gelatinous fluid.

Case 3.—In July of this year, I was asked by Mr. Booth, of Mirfield, to see, with him, an elderly female, the right half of whose abdomen was filled with a prominent mass, the origin of which she attributed to her daughter having accidentally trodden upon her in getting out of bed a few months before. The increase in size had been gradual, and had been attended by considerable pain and some febrile disturbance. On percussion, the tumour was dull, and on handling, an indistinct fluctuation was made out. A few days afterwards, I withdrew by means of the aspirator several ounces of pus, and was thus enabled confidently to pronounce the case one of cellular abscess, and to confirm the patient's own opinion as to the origin of the disease.

Case 4.—Not many months ago, a man, aged about 40, of weak intellect, and therefore unable to give any reliable history of himself, was sent from Tadcaster and admitted into the Leeds Infirmary under Mr. S. Hey, with complete retention of urine, and his bladder distended so as to reach above the umbilicus. Our resident medical officer, Mr. M'Gill, at once passed a No. 8 silver catheter, and drew off forty ounces of fetid urine—as much as would flow. And yet the distension was not wholly removed; above the pubes, a round fluctuating swelling remained, which, from the rectum, was found to communicate with a soft elastic bulging there distinctly felt. The aspirator was applied from the rectum, and by it twenty-five ounces of fluid were quickly pumped out, whereupon all tumour was found to have disappeared. The fluid was clear, had a specific gravity of 1004, and, besides large quantities of common salt, contained numerous hooklets and undamaged echinococci. The retention ceased, but the patient died a week afterwards from the inflammatory changes induced by the long continuance of the obstruction. At the *post mortem* examination, the hydatid disease was thought to have occupied the prostate itself, and similar disease was found both in the liver and omentum.

I will finish my illustrations of the diagnostic value of the aspirator by briefly relating a very important and not less interesting case which occurred recently in the hospital practice of my colleague, Mr. Wheelhouse, and which I had the opportunity of seeing in consultation with that gentleman.

Case 5.—J. M., aged 30, a striker by occupation, had been the subject of a right inguinal hernia for four months, and had never worn a truss. The bowel had frequently from time to time descended, and had always been returned without difficulty. About breakfast-time, on October 2nd, 1872, whilst he was at work, the hernia suddenly protruded with pain. Finding himself unable to reduce it as usual, he went home. Symptoms of strangulation soon supervened, and his sufferings became greatly increased. It was not, however, until the evening of the 4th that he sent for his medical attendant, who ordered his immediate removal to the infirmary. When seen on admission, he was vomiting frequently; his abdomen was highly distended, tympanitic, and tender on pressure; his countenance betrayed anxiety, and his pulse was small and thready. The right inguinal region was occupied by a swelling of the size of a hen's egg, not very tense, but upon which taxis produced not the least impression. Opium was administered, and taxis again failed. He was then placed under the influence of chloroform, and an attempt was once more made to reduce the rupture, but in vain. The finest of the needles of the aspirator

was now introduced and attached to the syringe, whereupon two ounces of bloody serum were removed, and the swelling vanished altogether. The finger could now be passed without obstruction through the inguinal canal as far as the internal ring. Under these circumstances, it was decided to postpone any further proceedings until the following morning. Vomiting occurred at intervals during the night; but at the morning visit, the patient stated that the rupture had again descended, and that he had been able to reduce it himself. It was not until the morning of the 6th that all vomiting ceased; but from the first there was a gradual and steady amelioration of his symptoms, and, finally, he has made a perfect recovery.

It is by no means an easy matter to state, with any degree of certainty, the actual order of events in this most fortunate case. It may be safely concluded, however, that the use of the aspirator precluded the necessity of following that good old rule—"when in doubt, operate."

I will now go on to mention a few instances in which aspiration has been resorted to as a means of treatment. Two of the earliest occasions upon which I made use of the instrument were in cases of advanced chronic hydrocephalus.

Case 6.—In the first, a child, fifteen months old, I removed on May 18th, 1871, by means of the finest needle passed through the anterior fontanelle, six ounces of fluid; and on the 22nd, twelve ounces. The child died on the 23rd in convulsions.

Case 7.—The second child was only three months old when first brought under notice. On July 22nd, 1871, I removed five ounces of fluid; on the 25th, three ounces; on August 1st, an ounce and a half; and subsequently, on seven occasions, at intervals of a few days, one ounce of fluid was removed. This case terminated fatally, also by convulsions, on September 13th.

A careful *post mortem* examination was made in each of the two instances, with the special view of discovering the immediate effects of the introduction of the needle, but no trace whatever could be detected either in the membranes or in the brain-substance.

Soon after I became familiar with the aspirator, it occurred to me that it was not unlikely to prove useful as an aid, under certain circumstances, to the reduction of strangulated hernia. I thought that, if the sac, for instance, contained a large amount of fluid, the withdrawal of the fluid might enable the surgeon to apply his reducing force more directly, and, therefore, more efficiently, upon the solid constituents of the hernia. And, again, if the strangled intestine were emptied of its fluid and gaseous contents, its reduction by taxis might be facilitated. In five examples of this affection, all presenting

conditions apparently favourable to the proceeding, and in all of which taxis under chloroform first proved insufficient, I have practised the use of the aspirator, in the full hope of being able to avoid the major operation; but, hitherto, my efforts have not met with success. In all the five, herniotomy was finally resorted to; and it is interesting to observe that, in none was there any sign to show where the needle had penetrated. Cases have lately been referred to in the journals in which success has been achieved by operators abroad. I am still hoping that a further trial may lead to more satisfactory results in my own hands.

Some few months ago, several gentlemen showed great anxiety to obtain the credit for themselves, or for their friends, of having been the first to tap the intestines in cases of great flatulent distension. I remember the late Mr. Teale, in 1860, whilst introducing an acupuncture-needle twenty or thirty times through the abdominal walls in a case of excessive tympany following herniotomy, remarking to the students around him that, in his early days, he had been accustomed, under similar circumstances, to use the trocar after the manner of veterinary surgeons; but that, of late years, he had preferred the acupuncture-needle, as being at the same time less dangerous and equally efficient. Calling to mind this advice, I employed the aspirator on several occasions in May 1871, to the great relief of an elderly man, whose leg I had amputated by the supracondyloid method, and who in his last two or three weeks suffered in an unusual degree from excessive flatulent distension. On *post mortem* examination, a few red points, on both the parietal and visceral peritoneum, were thought to indicate the spots at which the needle had entered.

The instances are now numerous in which I have employed the aspirator, with decided advantage, in the emptying of chronic abscess. I will content myself with relating one example, by no means a solitary one of its kind.

Case 8.—In May 1871, I was consulted by Mr. T., aged 40, who for nearly six years had been suffering from excessive pain in the lumbar and lower dorsal spine, and at the top of whose right thigh a swelling had for nine months been gradually increasing. The case, as it presented itself to me, was, in short, one of marked angular curvature at the junction of the dorsal and lumbar vertebræ, accompanied with a psoas abscess, which, when he stood erect, was about as large as an orange. On June 10th, I removed seven ounces and a half of pus by aspiration, draining the abscess as completely as possible. In a few days fluctuation returned, and the swelling gradually increased. On June 28th, the aspirator was again applied, and three ounces and a half of pus removed. From this time the abscess may

be said to have been cured; for although, on February 7th this year, I was induced once again to introduce the needle, from a feeling of suspicion that matter had reformed, I was unable to procure a single drop. At the present time no difference whatever can be detected between the two sides, and he is quite free from all pain. The curve, of course, still remains; and, as a matter of precaution, I am continuing to enjoin a large amount of rest in the recumbent position, and an entire freedom at other times from such movements as would be likely to affect injuriously a spine which has undoubtedly been extensively diseased.

There are few conditions which more frequently call for the attention of the surgeon than the various forms of joint-effusion; and, whilst some of these are of a transient character, or readily yield to appropriate treatment, there are others, the nature of which it is to be obstinately persistent; or, again, in which the effusion is but the precursor, if not indeed a chief factor, in the production of those processes which, if constructive in their tendency, end in ankylosis; but, if destructive, lead only to excision, amputation, or death.

It is within my own recollection—nay, I believe the practice still lingers in the dark corners of our profession—that surgeons were in the habit of spending month after month—aye, and in some instances, year after year—in leeching, blistering, burning, compressing, mercurialising, and drugging their patients, with the sole object of procuring absorption by a membrane, which, it may be, had ceased to be capable of absorbing, and which, at all events, obstinately refused to take the desired turn; or perhaps, goaded by the constant irritation from without, openly rebelled, as it were, in the form of suppuration and destruction.

Whilst no means were too severe to be applied to the exterior, it was a cardinal doctrine that to interfere with the interior of a joint—except in cases of acute suppuration—was an unsurgical and unwarrantable proceeding. The sacred character of synovial membranes, like many other phantoms, has vanished before advancing science. Dropsical joints are now treated by tapping, just as are the peritoneum, the pleura, or the pericardium. A couple of years ago I published in our Journal the history of a series of knee-joints which I had successfully treated, when in an early condition of inflammation, by *free incisions*, made under the protection of an antiseptic spray. And now that we possess the aspirator, we shall hardly be disposed, I imagine, to consume as many days as we formerly did months, in the endeavour to disperse a fluid whose presence is not seldom the sum total of disease.

The following are selected from a considerable number of cases which have been similarly treated:—

Case 9.—A gentleman aged 21, in falling from his bicycle, struck his left knee a violent blow against the corner of a wall. Faint, and in great pain, he limped, as best he could, to his home, where I saw him on the following day, June 8th this year. The joint was distended from effusion within. He suffered but little, and could bear manipulation well. Rest in bed, an evaporating lotion, and an occasional purgative were prescribed. This treatment was duly persevered in for a month, without producing any perceptible change in the condition of the joint.

On July 5th I applied the aspirator, making use of the smallest trocar, and drew off seven ounces of fluid, which consisted of little else than blood. It was the first time I had met with blood in a joint under similar circumstances, and I felt somewhat anxious as to the result. The knee, although emptied of fluid, looked decidedly thicker than the sound one, but was neither painful nor tender. The limb was placed upon a straight splint, and the evaporating lotion was continued. There was no return of fluid, and, indeed, nothing of an untoward nature at any time arose. On August 6th he was allowed to get up, with the joint supported by a plaster of Paris bandage. In six weeks the bandage was removed; and at the end of September he could walk well—a little stiffness and a slight thickening of the joint alone remaining.

The following is a somewhat similar case:—

Case 10.—F. M., aged 40, a dyer by occupation, was admitted into the Leeds Infirmary on September 16th, 1872. On August 31st, whilst attempting to climb over a high wall, he fell upon his left knee. Although in very great pain, he walked home—a distance of about two hundred yards—and on arriving there he found that his knee was much swollen. Nevertheless, for three days he continued at his work, and only then desisted because of extreme suffering. After a few days' rest the pain ceased, but the swelling remained as before. Lotions and poultices were applied, and during two days the joint was painted with tincture of iodine. On admission, there was decided, though not excessive, swelling of the knee, and fluctuation was distinct. On September 18th, by means of the aspirator, I withdrew three ounces of a fluid deeply tinged with blood. The limb was placed upon a straight splint until September 28th, when a plaster of Paris bandage was substituted, and he was made an out-patient. On October 14th the bandage was removed at his urgent request, and, as recovery was apparently complete, he was permitted to return to his employment.

Satisfactory as were the results in the two cases just related, I think I am justified in attaching more importance to the two

following; for, if my belief in the pyæmic origin of each be well founded, it would hardly be possible to exaggerate the value of a means whereby an issue so successful was accomplished.

Case 11.—Joseph J., aged 21, a coal-miner, was admitted into the Leeds General Infirmary on September 19th, 1871, on account of acute periostitis with suppuration affecting the right humerus, of four months' duration. Incisions were made for the evacuation of pus. On October 14th, after several chills, not amounting to actual rigors, followed by feverish symptoms. and a rapid rise of temperature, he complained of great pain in the left hip-joint, which was intensified on the slightest movement. The application of the long splint afforded some relief; but the surgical fever contined without abatement, and the uniformly great difference between the morning and evening temperatures indicated the presence of acute suppuration. On October 27th the left knee became suddenly swollen and acutely painful. On November 1st this joint was aspirated, and two ounces of a clear fluid withdrawn—an operation, so far as that particular joint was concerned, which gave immediate and permanent relief. The general condition of the patient, however, was unimproved; and, as the affected hip continued still the source of sleepless nights and weary days, the aspirator was applied to this joint also on December 10th, with the result of extracting nine drachms of thick pus. The operation acted like a charm; his suffering was at once removed, and soon the balance of healthy action returned. On January 12th, 1872, he was discharged able to walk well, and with free movement in both hip and knee.

Case 12.—The second case may be related in few words. A man, aged 52, was in the Leeds Infirmary suffering from old stricture of the urethra with many perineal fistulæ. I had admitted him for the purpose of his undergoing the operation of perineal section. When he had been in the ward a few days he was seized with rigors, which were followed by inflammatory fever, and pain with some swelling of the left knee-joint. On the day after his seizure, fluctuation being decided, I removed by the aspirator an ounce and a half of turbid synovia. The pain at once ceased; and a week afterwards he was sent home for awhile to recruit his health, lest an operation then performed should be followed by more serious consequences.

One case more and I have done. It was the second of four I have had of its kind, and is selected now chiefly on account of its brevity.

Case 13.—On December 26th, 1870, a man, aged 38, was admitted under my care into the Leeds Infirmary with his bladder fully distended, and totally unable to pass a drop of

urine. The retention had lasted for fifty-four hours, and several efforts had been fruitlessly made to enter his bladder. On my visit he had already been placed by our resident medical officer in a hot bath, and opium had been freely given. A gentle attempt at catheterism sufficed to demonstrate a closure of the urethra a little beyond the bulb, and was followed only by the escape of a few drops of blood. Without further delay I plunged the finest needle of the aspirator straight through the abdominal walls into the bladder, and, attaching the syringe, drew off thirty-eight ounces of urine. In about six hours dribbling by the natural passage began, and, after a few days, I was able to commence the treatment of his stricture under circumstances not less favourable than if retention had never occurred.—*British Med. Journal, Dec.* 7, 1872, *p.* 625.

36.—ON EXPLORING AND TAPPING.

By Dr. William Roberts, Physician to the Manchester Infirmary.

Exploring by Tubular Needle and Syringe.—This method far excels the grooved needle, or small trochar and canula. The instrument resembles the apparatus used for subcutaneous injection. It consists of a tubular needle and a syringe.

The needle is about the thickness of a medium sized toilet-pin, an inch and a half long, finely pointed and made of gold. It is mounted at the hilt with a cross-bar and a screw. The syringe is composed of glass, mounted in German silver, with a metal piston, and made to contain about twenty minims. The hilt of the needle screws into the nozzle of the syringe.

In exploring a doubtful tumour, or a suspected collection of fluid, the needle is screwed on the syringe and the piston driven home. It then forms a compact and easily-handled instrument. The skin is first tightened over the part to be explored, and the needle thrust in. The piston is then drawn up.

If there be pus or any other kind of liquid, the syringe is immediately filled therewith, and the instrument may be withdrawn. If the substance be solid, only a few particles of blood come up; the syringe should then be unscrewed, leaving the needle *in situ*—and, the piston being driven home again, the syringe should be re-screwed to the needle and the piston drawn up a second time, with a sharp action, so as to exercise the maximum of suction power. By this manœuvre small particles of even a solid tumour can be sucked up into the needle or into the syringe; and, if the tumour be a soft solid, like an encephaloid growth, a grain or two of the material can be obtained for examination.

After the needle is withdrawn the puncture should be pressed firmly with the finger for about a minute, so as to permit the wound in the track of the needle to contract, and in this way to prevent the risk of extravasation.

The advantages of this method of exploring are:—

1. A fine round instrument makes a minute *punctured*, and not an *incised* wound through the tissues, so that it can be driven safely and without anxiety into almost any part.

2. An available quantity of material is obtained for examination, either by the microscope or by chemical tests, unmixed with fragments of the tissues through which the needle has penetrated. By thrusting down the piston (after the instrument is withdrawn) the contents of the syringe, or any minute particles sucked up into the hollow needle, can be discharged on a microscope slide, or into a test-tube, as the case may be, and subjected at once to examination.

3. If the explored part be found to contain a collection of pus, or of any other fluid, it may, if it be thought desirable, be at once evacuated—either by removing repeated syringefuls if the collection be a small one, or, if it be large, by attaching to the needle an india-rubber tube previously filled with water, as will be more fully described in the next section.

Of the safety and convenience of this mode of exploring I can speak with confidence, after a large experience of several years, both in the wards of the Infirmary and in private practice.

I have thus explored suspected tumours, cysts, and abscesses in almost all parts of the body. I have explored the chest repeatedly, in pleuritic effusion, and once in a case of solid (malignant) infiltration of the lung—the peritoneal cavity, and various abdominal tumours and cysts, more times than I can remember—the liver, in malignant disease of the organ, seven times—four times in cirrhotic induration—twice in albuminoid or waxy enlargement—five times in hydatid cysts of that organ—the spleen twice in chronic tumours—the kidneys four times in malignant disease, and once in pyonephrosis—and a large aneurism of the abdominal aorta on three successive occasions. In none of these cases did the smallest ill effect arise.

Tapping by Tubular Needle and Syphon-arrangement.—In the previous section of this paper I have explained how small abscesses and cysts can be evacuated with the tubular needle and syringe, by the removal of one or more syringefuls. In the hands of some of my medical friends this has been found a

useful method in small abscesses of the neck, when it is important to avoid unsightly scars. The wound made is so small that it can be perfectly sealed up by a drop of plastic collodion, and the operation may be repeated once or more, without risk of admission of air, until the abscess dries up. The principal drawback to this method is, that if the pus be flaky, the flakes plug up the bore of the needle and interrupt the operation. A slight obstruction of this sort may be dislodged by a thrusting movement of the piston; but if the flakes be large, they become impacted in the needle and put a stop to further progress.

When the collection is larger, and the fluid to be removed is serous or watery, a better arrangement is to attach an india-rubber tube, previously filled with water, to the hilt of the needle.

The needle employed is the same as that used for exploring, described in the preceding section. For reaching deep-seated collections, I employ a second, somewhat thicker needle (as thick as a stout toilet-pin), three inches long. The india-rubber tubing is three and a half feet in length, and of the thickness of that employed for infants' feeding-bottles. One end is mounted with a small screw fitting on to the screw on the hilt of the needle, the other end is furnished with a small stop-cock.

The object of this arrangement is to employ syphon-power as a soliciting force: for the bore of these needles is so small that liquids will not flow through them except with the aid of either a propelling or a soliciting force. When the apparatus is in operation, the needle corresponds with the short leg of the syphon, and the elastic tube with the long leg of the syphon; the excess of weight of the column of liquid in the long leg over that in the short leg represents the amount of soliciting force operating at the point of the tubular needle.

In tapping by this method the tubular needle may, in the first instance, be attached to the syringe and thrust into the cavity to be tapped, as in the process of exploring. The existence of fluid having thus been ascertained, the syringe is unscrewed (the needle being left in), and the india-rubber tube (previously filled with water) screwed on in its place. The lower end of the elastic tube is then placed in a receiving vessel on the floor, and the stop-cock opened.

If the existence of fluid is known, or confidently reckoned on, the elastic tube may be screwed on to the needle at once. The tube is then filled with water and its stop-cock shut. The needle is then thrust into the cavity to be tapped, and the flow set a-going, by opening the stop-cock, in a vessel on the floor.

The previous filling of the elastic tube with water is, of course, absolutely necessary to the success of the proceeding. The simplest way of accomplishing this is to place the screw

end of the tube in a jug or bowl of water, and to suck up the water through the opened stop-cock at the other end, until the tube is full. If this proceeding is objected to on the score of cleanliness, the following plan may be adopted. The stop-cock being previously shut, the tube is rolled round it into a tight ball—this expels the air from it. The screw end is then submerged in a vessel of water on the table, and the ball is allowed to unwind itself towards the floor. The stop-cock is then opened, and the water soon begins to run. The stop-cock being again shut, the tube remains full of water, and may be brought to the bedside, ready to be screwed on the needle as soon as the latter is introduced into the cavity to be tapped.

This method of tapping is not applicable to abscesses or cysts with viscid contents, but is of service to evacuate serous and living hydatid cysts; it may also be used to evacuate peritoneal and pleuritic (? pericardial) effusions, or a distended bladder.

The rate of flow obtained by this method, as applied in clinical practice, is from two to three pints per hour. I find by experiment that the speed with which liquids pass through tubular needles, is affected by the bore of the needle, its length, and the available fall; that is, the vertical height of the cavity to be tapped (as the patient lies in bed) above the floor. Operating with the needles already described, and with an available fall of two to three feet, I have in practice obtained a flow of two-and-half to three-and-half pints per hour. Serous fluids, such as pleuritic and peritoneal effusions, and urine, flowed at the same rate as pure water—so did the contents of ovarian cysts when they were simply serous—but pus and viscid ovarian fluids flowed very slowly, or not at all.

This method may be applied to ascites or an ovarian cyst, when it is desirable to avoid the shock of a too rapid evacuation. I have in this way emptied accumulations of twenty and thirty pints. Such large collections take six or eight hours to run; but as the presence of the needle (which is secured *in situ* by strips of adhesive plaster over the cross-bar at the hilt) causes no pain, and the patients lie quietly in bed, and even take their meals while the operation is proceeding, this is no great inconvenience.

Tapping the Bladder by Needle and Syphon-arrangement.—I have not yet had an opportunity of testing the utility of this method in actual practice; but a medical friend, whose name has unfortunately escaped my memory, informed me that he had used it with success. It seems to offer considerable advantages over the usual modes of proceeding. In the dead body, I have made repeated trials with the most satisfactory results.

In children and thin persons the inch-and-half needle is sufficiently long; but in fat persons the three-inch needle should be used. I found it easy to pass the needle into the bladder immediately above the symphysis pubis without wounding the peritoneum. The puncture made by the needle is so minute that there could scarcely be any risk of extravasation of urine, even if the operation were required to be repeated a second time.

I would also suggest the use of this method for tapping hydrocephalic accumulations, and those of spina bifida.

Tapping by fine Canula and Syphon-arrangement.—In removing large collections of fluid from the chest, abdomen, or an ovarian cyst, it is usually convenient to employ a somewhat larger instrument than the tubular needle.

After a trial of instruments of various forms and sizes, I have adopted, as the most generally useful, a straight silver canula, furnished with a stop-cock and screw. Two sizes are sufficient —one an inch-and-half long, and about the thickness of a hydrocele canula—the other two inches long, and about the thickness of a crow-quill. The smaller canula is used in all ordinary tappings of the chest and abdomen, and in evacuating ovarian cysts with diffluent contents; the larger one is used for large abscesses and other purulent collections, and for ovarian cysts with less diffluent contents. Each canula is fitted with a suitable trochar, and the elastic tube, mounted with a screw at one end and a stop-cock at the other, already described in the previous section, completes the apparatus.

The steps of the operation are similar to those in operating with the tubular needle. The elastic tube is first filled with water, and its stop-cock shut. The canula, armed with the trochar, is then thrust into the cavity to be tapped—no previous incision of the skin being necessary. The trochar is now withdrawn, and the stop-cock on the canula immediately shut. The elastic tube is then leisurely screwed on the canula, and the lower end placed in the receiving vessel on the floor. Finally both stop-cocks are opened, and the fluid is allowed to run. I should mention that the elastic tube is furnished, near its upper end, with a short length (about two inches) of glass tubing to serve as a window, to enable the operator to watch the proceeding. The rate of flow obtained by this arrangement, and using the smaller canula, varies from eighteen to thirty pints per hour. After the flow has ceased, the canula is withdrawn, and the small puncture is sealed with plastic collodion, or a piece of adhesive plaster.

The advantages offered by this method over the ordinary proceeding with simple trochar and canula are the following.

A much smaller instrument can be employed—the evacuation proceeds equably and gradually—there is no necessity for any flannel bandages round the abdomen—the patient lies quietly in bed while the operation is proceeding—it is perfectly neat and cleanly—and in the case of cysts their contents can be emptied more completely. In thoracentesis no air can enter the chest so long as the lower end of the tube is kept submerged in the fluid contained in the receiving vessel.

I should mention that towards the end of the operation little bubbles of air are often seen passing down, or up and down, the little piece of glass tube which serves as a window to watch the proceeding. This appearance is not due to any air passing from or into the cavity which is being tapped, but to the difficulty of obtaining perfectly air-tight joints in the apparatus. As the supply of fluid from the tapped cavity falls short, the soliciting force of the syphon begins to act on the joints of the stop-cock, and, if these be not air-tight, draws in small bubbles of air into the elastic tube. This does not, however, practically interfere with the complete success of the operation. Nevertheless in thoracentesis it is well to guard against the aspiratory action of the chest, in case the apparatus leaks. This is readily accomplished by caulking the joints of the stop-cock on the canula with soap, or putty, or tallow.

Clearing the Canula.—If the canula should become, in the course of the operation, clogged by any flaky or fibrinous matter, it can be cleared, generally, by the following simple manœuvre. The elastic tube is firmly compressed between the finger and thumb of the left hand at a distance of some eight or ten inches below the canula; then the finger and thumb of the right hand are placed compressingly just above those of the left, and, by a rapid movement, they are slipped up along the tube, still tightly compressing for a few inches. This causes a momentary forcible reflux of fluid through the canula, which dislodges the obstacle impacted in it.

If this be insufficient, both stop-cocks (that on the canula and that at the lower end of the elastic tube) must be shut. The elastic tube is then unscrewed from the canula, and the latter cleared, either by the introduction of the trochar or a probe. The tube is then screwed on again, and the operation proceeded with as at first.

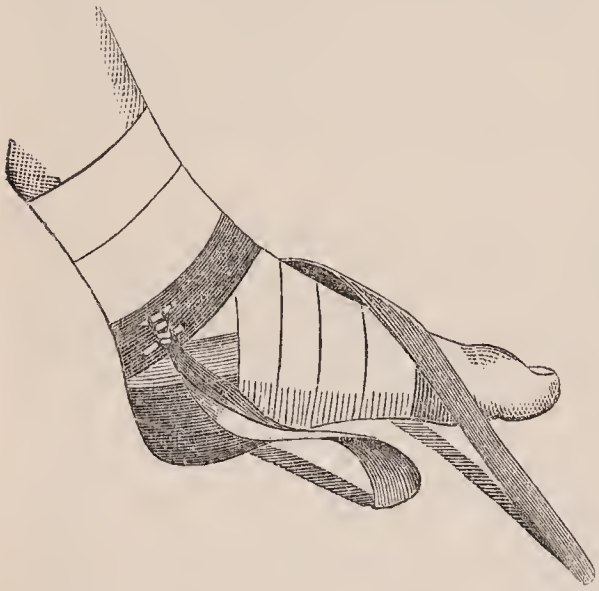
Judging from my own experience, the evacuation of abscesses by this method is only advisable in the case of large chronic abscesses, when it is important to prevent the admission of air. In such cases only the larger trochar is generally available, on account of the numerous flakes usually mixed with pus.—*Liverpool and Manchester Med. and Surg. Reports*, 1873, *p.* 66.

37.—ON THE TREATMENT OF TALIPES VARUS.

By Frederic Clowes, Esq.

[Mr. Clowes, of Windermere, recommends the following steps to be taken in these cases. He says]

In the latter stages of the treatment of this deformity the slipping backwards and upwards of the heel is often very embarrassing. Even after free tenotomy the treatment is often hindered and delayed by it in restless children, and it is not easily prevented by any of the various modifications of Scarpa's shoes with which I have been supplied. A very simple arrangement in bandaging does, however, entirely prevent this slipping of the heel. After the bandage has been applied in the usual way to the foot and ankle, a broad tape or narrow bandage should be passed over the front of the ankle, round the limb, and crossed behind it just above the heel, then carefully sewn to the bandage on each side *below the malleolus* to prevent its slipping, as shown in the drawing.



When the foot thus prepared is put into the shoe, the ends of the tape will come out in front of the heel-piece, and should be tied tightly under the sole of the instrument. It will be seen that this strap opposes the action of the instep straps of the shoe, and if all these are sufficiently tight the heel is held firmly down to the sole of the apparatus. This complete fixity of the heel is the great desideratum, both as regards obtaining flexion of ankle, eversion of foot, and unfolding its distortion. So that the surgeon who can accomplish this has overcome his greatest difficulty. This plan is especially applicable to the large class of more or less relapsed cases in which re-operation is often resorted to—one of the "unnecessary operations" of Dr. Little. Cases of this kind, which formerly I should scarcely have attempted to treat without re-operation, have been, I may say, rapidly cured since I have adopted this simple means, availing myself also of the advantage of Dr. Little's double-hinged lever instrument with thumb-screw movement, which gives the patient the benefit of a stop-joint, set at any angle required.—*Lancet, Feb.* 1, 1873, *p.* 186.

38.—ON THE OPERATION OF OPENING THE LARYNX BY SECTION OF THE CARTILAGES, FOR THE REMOVAL OF MORBID GROWTHS.

By Arthur E. Durham, Esq., Surgeon to, and Lecturer on Anatomy at, Guy's Hospital.

The operation of opening the larynx by section of the cartilages, as well as of the soft parts, in order to facilitate the removal of morbid growths and foreign bodies, is by no means a new one. It was suggested, clearly described, and strongly recommended by Desault some hundred years ago; and indeed it is still sometimes spoken of as "Desault's operation." It does not appear, however, to have been ever actually practised by that distinguished surgeon. But of late years—and especially since the use of the laryngoscope has rendered the diagnosis of laryngeal affections comparatively easy and certain—it has been repeatedly performed in this country, and somewhat more frequently abroad. Nevertheless, so far as I am able to judge, the merits of this method of proceeding are, as yet, neither so generally recognised, nor so highly appreciated as it seems to me they deserve to be; while on the other hand the difficulties and dangers involved are very commonly and very greatly over-estimated.

Case.—[A female, nine years of age, was admitted into Guy's Hospital in 1862, suffering from such urgent dyspnœa that tracheotomy was at once performed. During the next four years she was admitted no less than eleven times.]

The most persevering attempts were made from time to time to obtain a view of the interior of the larynx. But the extreme sensitiveness of the parts, and the obstinate resistance of the patient defeated all such attempts until during her last stay in the Hospital. In July, 1866, I succeeded in seeing quite distinctly a considerable warty growth on the left false vocal cord, and in making out, though somewhat less positively, that the whole of the larynx was blocked up by similar growths.

On 27th of July, chloroform having been administered through the tracheotomy canula, I passed a small curved sharp-pointed knife straight through the superficial structures, the crico-thyroid membrane and the mucous membrane of the larynx, and cut directly upwards in the middle line through the thyroid cartilage, &c., thus dividing all the structures by one incision as high as the thyro-hyoid membrane, which was only slightly cut. The cricoid cartilage was subsequently divided in order to give more room. Some hemorrhage and somewhat severe spasmodic cough followed the first incision. When these had subsided (which they did very speedily), and

the lips of the wound were drawn apart, it was at once seen that the whole cavity of the larynx was stuffed with warty growths varying in size and precise situation. The largest was that already mentioned as seen by aid of the laryngoscope on the left false vocal cord. There were none, or only two or three minute ones, *below* the true vocal cords; but with this exception, the mucous membrane of almost every part of the interior of the larynx was covered with them. All were carefully removed; some were cut off with scissors, others were twisted off with forceps. The slight bleeding which ensued was easily arrested by free exposure to the air, and temporary pressure by means of sponges. The wound was closed by sutures and strapping. The tracheotomy canula which had not been in any way interfered with during the operation was left *in situ*.

The next day the patient could breathe through the larynx, and could produce audible sounds.

On the seventh day after the operation the recent wound had entirely healed. On the 10th day the tracheotomy canula was removed, after having been continuously worn for just four years. The opening very speedily closed up; and on 22nd August, not quite a month after the operation, the patient left the Hospital in excellent health, breathing easily and well, and able to speak quite audibly.

I last saw her about a year ago, more than four years after the operation. She had grown into a fine thoroughly healthy young woman, breathing and speaking as though she had never had anything the matter with her larynx. Her mother said of her "You might hear her singing from the top of the house to the bottom."

Laryngoscopic examination showed no indications of any return of the growth.

Having attempted to show that the danger to life attending this operation is comparatively small—at any rate very considerably less than has been represented—I pass on to make a few remarks upon some of the difficulties likely to be encountered.

Judging from my own experience and observation, and from a careful study of the recorded experience of others, I have no hesitation in expressing the opinion that such difficulties are fewer, and more easily overcome than appears to be generally supposed.

First, with regard to hemorrhage: If the incision is kept strictly to the middle line, it is impossible that any large vessel can be wounded. Moreover the parts are necessarily divided to such an extent that any wounded vessel is fully exposed and easily secured. The effects of entrance of blood into the

trachea *look* much more formidable than they really are. If only the divided parts are widely opened out, and so maintained that the air may enter freely, any blood that may be drawn in (or, at any rate, the greater part of it) is sure to be very quickly coughed out again. There is a great difference between the conditions in this operation and those in a simple tracheotomy. In the latter case the opening made into the air-passage is comparatively small, deep-seated, and, it may be, half-hidden. Blood may possibly, therefore, enter from some unseen source more quickly than air, and more quickly too than it can be expelled. But when the cartilages of the larynx are divided, there ought to be easily maintained both free entrance for air and free exit for blood.

Bleeding from the internal surface of the larynx is easily enough controlled and arrested by pressure or the application of styptics when the bleeding surface is so completely exposed to view as it may, and ought to be in this operation. The difficulties that are stated to have been met with appear to have arisen in great measure from insufficient exposure of the parts.

The introduction of a tracheotomy canula (in case tracheotomy has not previously been performed) into the lower part of the wound, and the insertion of a small piece of sponge into the trachea above the canula, may afford material aid in securing free respiration and hindering the flow of blood down the air-passages.

The spasmodic up-and-down movements of the larynx, and the violent paroxysms of cough that occur when the larynx is opened, may often give rise to trouble and delay in the operation. But after a little time, the parts being allowed to remain at rest, these symptoms subside; and, although for a period they may seem alarming, no danger need be apprehended if only a full supply of air is ensured.

Next, with regard to the division of the cartilages:—Experience shows that the operation may be easily and successfully accomplished, even though the cartilages are densely ossified. In such case, however, cutting forceps or strong scissors answer better than the knife.

There is no great difficulty in avoiding the vocal cords while cutting through the thyroid cartilage. In only one case among those recorded in the Appendix it is stated that one of the vocal cords was accidentally injured. In this case no material harm resulted, though the voice was probably less perfectly restored than might otherwise have been the case. If the opening is commenced below, and a grooved director passed up between the vocal cords, their safety may be absolutely insured; but such a proceeding I believe to be unneces-

sary, it seeming to me to be the best plan to divide the cartilages by cutting through them from without inwards, and from above downwards, and to separate slightly the alæ of the thyroid cartilage before actually penetrating the mucous membrane.

In the removal of the growth no great difficulty is likely to occur unless some important part of the larynx is structurally involved in the growth. In such case the part involved may be removed to a greater or less extent with the tumour,—as was done in a case recorded by Kœberlé, in which he removed the right vocal cord with the growth, and exposed the internal surface of the thyroid cartilage (see Case 20 in Appendix); or, some portions of the growth may be cut away and the remainder deeply cauterised; or it may prove necessary to abandon the operation altogether. But whatever difficulty may arise in the removal of the tumour, whether from its nature or connections, it is obvious that such difficulty can be overcome much more readily and much more certainly when the larynx is freely opened, as in this operation, than could possibly be accomplished by any method of proceeding carried on through the natural passages.

In a considerable number of the cases in which this operation has been attended by success, many abortive attempts had previously been made to remove the growths through the mouth—attempts that were defeated in part by the difficulty experienced in detaching the growths.

With regard to the best method of performing the operation, and the precautions to be observed, little need be said beyond what has been already advanced or may be gathered from the records of cases. The various methods adopted by different surgeons are duly described with the general details of the several cases. The extent to which the laryngeal walls should be incised must of necessity be determined by the precise situation and extent of the growths which are to be removed. As a general rule it is probably best to begin by dividing the thyroid cartilage and crico-thyroid membrane, and subsequently to continue the section upwards through the thyrohyoid membrane, and downwards through the cricoid cartilage and upper rings of the trachea to such an extent as may be necessary in order to expose fully and completely the bulk and points of attachment of the growth or growths. Experience has shown, as may be seen on reference to the Appendix, that cases in which both thyroid and cricoid cartilages, thyro-hyoid and crico-thyroid membranes, and the upper rings of the trachea have been divided, have been followed by results as successful as those obtained after section of the thyroid cartilage alone.

The questions,—1st as to whether tracheotomy should be performed as a preliminary; and, 2ndly, as to whether it is desirable to leave the canula in the trachea after the major operation has been completed,—must be determined by the circumstances and conditions of the particular case to be dealt with. In many instances it has happened that there has been no option, and tracheotomy has been performed under urgent necessity, and at times when the major operation would have been impracticable, or even perhaps before it has been possible to arrive at a satisfactory diagnosis.

There can be no doubt that in the majority of instances it is advantageous that a canula should be in the trachea, while the growths are being removed, and until all bleeding has ceased. But so far as the result is concerned it would appear to matter very little whether the trachea has been opened at some anterior period, or whether this has been done as a first act in the major operation. In each of my own three cases tracheotomy had been performed some years previously—in Mr. Colley's case a short time previously—while in Mr. Bryant's the tracheotomy and the opening of the larynx formed parts of one and the same operation. In all cases in which the growths have been numerous, or their attachments have been extensive, and in which, therefore, the mucous membrane of the larynx has been exposed to much damage and rendered especially liable to become inflamed, I think it desirable to leave the canula in the trachea, at any rate for some days, as a safeguard. It is true Debron considered the presence of the canula to have indirectly conduced to the death of his patient. But this can be regarded only as a very exceptional occurrence. In case the growths should be few or single, and the mucous membrane but slightly interfered with, it may perhaps be considered safe to dispense with the use of the canula and to close up the whole wound at once.—*Medico-Chirugical Transactions*, vol. lv, 1872, *p.* 17.

39.—NEW FRENCH METHOD OF DRESSING WOUNDS.

By Dr. Walter Reid, Surgeon, R.N.

A new method of dressing wounds, at present attaining great popularity amongst French surgeons, is that which is known as the "pansement ouaté" of M. Alphonse Guerin, of the Hotel Dieu. It consists in the use of large quantities of cotton wadding, somewhat after the manner of treating extensive burns by the same material. About two years ago, towards the close of the war, and during the days of the Commune, M. Guerin first put this in practice in the Hopital St. Louis. The properties which cotton wadding possesses of

filtering the atmosphere, the regular elastic compression and uniform temperature which its application induces, were qualities which he thought might be turned to good account in the treatment of wounds and other surgical diseases. An attendance of nearly six months in the hospitals of Paris during the course of the winter has enabled me to write with some authority on this subject, which well merits the attention of the profession in this country. The method is peculiarly applicable to cases of amputation, and in order to describe the manner of using it I will suppose a case of circular amputation at the thigh. Bleeding being carefully stopped, the ligatures are cut short, except that of the main artery, which is allowed to remain of the usual length. The wound is then washed with a solution of camphor and alcohol, of carbolic acid, or other disinfectant. The stump being now elevated and the loose integuments slightly stretched outwards by an assistant, portions of cotton wadding are inserted so as completely to fill without distending the cavity thus formed. Several layers of the same material are then applied over the stump, and carried in the form of broad rollers round the limb as high as the groin or pelvis. The volume of the whole ought to be at least three times that of the thigh, or about the circumference of the patient's waist. A number of bandages are then carefully applied, the constriction being at first moderate, but gradually increasing until it is as powerful as the hands of the surgeon can make it. The limb is now placed in a horizontal position, supported by a pillow, and allowed to remain so for twenty or thirty days.

The first thing that strikes the surgeon is that the patient, during the whole of this period, is free from pain, which neither comes on spontaneously, nor is it induced by the contact of surrounding objects, or by their shock. A peculiar odour is generally exhaled during the first ten or fifteen days, which, however, can be destroyed by the use of disinfectants applied to the outside of the apparatus.

M. Verneuil, the accomplished Professor of Clinical Surgery in the Hopital de la Pitie, has paid great attention to the temperature in these cases. He finds that it averages 38·5° C. (101·3° F.) during the first twenty-four or forty-eight hours. It then returns to the normal standard and never rises again. M. Guerin's own experience is similar.

I recently saw, in the service of M. Guerin, the removal of the dressing in a case of amputation of the upper arm after thirty-two days' application. On arriving at the deeper layers of wadding, they were found to be firmly glued to the integuments in the vicinity of the wound. About half a wineglassful of matter came away with the dressing. It had a peculiar

odour, not that of putrescent pus, but which M. Guerin attributes to the confined sebaceous secretion. The skin was quite normal, being free from redness, swelling, or any other sign of diseased action. The end of the bone was well covered by healthy granulations, as was also the whole of the traumatic surface; in fact, there was only a healthy granulating ulcer with the characteristic blue margins, showing that the process of cicatrisation was going on. M. Guerin regarded this case as a good specimen of the ordinary result of the cotton-wadding dressing. It was reapplied for another period, which he hoped would complete the cure. Two applications are generally sufficient; a few strips of adhesive plaster is all that is necessary afterwards, if the ulcer is not quite healed.

The dressing is also applicable to other diseases such as abscess and sinus, especially when connected with joints. I saw a case of synovitis of the knee-joint with sinuses treated by M. Guerin. The sinuses were laid freely open, and the apparatus applied. It has been removed since my return to England, but Dr. Blanc, of the Indian Medical Service, was present at the removal, and writes as follows: "The result was beautiful; all the incisions healed, and the knee about the same size as the healthy one." In these cases it is necessary to apply the wadding from the toes to the groin, in the upper extremity from the fingers to the shoulder.

In having recourse to this method of dressing, various precautions must be attended to. The patient during its application ought to be removed to an apartment where the atmosphere is pure, and then carried back to his own ward. The compression by the bandages ought to bear on all parts. alike, and be at the same time powerful. It is therefore necessary occasionally, during the first twelve days to apply more wadding and bandages, so as to conduce to this end. In amputations at the thigh the stump is liable to elevate itself, and cause the bone to protrude; this will be avoided by maintaining it in the horizontal position. The temperature must be taken regularly morning and evening, as it will give the first indication of anything going wrong. Nothing need be apprehended if it remains normal after the first forty-eight hours.

The advantages contended for by the advocates of the "pansement ouaté" are—

1. Avoidance of the action of the air, which irritates not only by its physical properties, but also by reason of the minute organised bodies which it holds in suspension.

2. A compression, firm, elastic, and, sustained, which moderates the afflux of the blood, and produces rigorous immobility of the parts, both in themselves powerful antiphlogistic agents in the treatment of wounds.

3. Remarkable diminution and frequently total absence of pain.

4. Constant uniform temperature of the parts, also an important agent in the treatment of wounds.

5. The ease with which it is applied, and the avoidance of the evil consequences of dressing the wound daily or every two days.

6. The protection afforded locally, thus facilitating the transport of the sick and their dissemination in crowded hospitals.

Lastly. The statistics of M. Guerin show a very marked diminution in the mortality of his large operations since his adoption of this method. Thus, during the troubles in Paris, when his wards were crowded with wounded men under the worst conditions, nearly all his large operations were fatal; but after its employment he had nineteen successful cases out of thirty-four large operations.

I might also mention its safety. Out of numerous cases, I have not seen an untoward accident, nor have I heard of any which might be fairly attributed to this new method of dressing.

It seems destined to render great service to the practice of surgery, particularly to that of the navy and army, in the treatment, for example, of severe wounds or accidents on board men-of-war; when, owing to the motion of the ship, it is almost impossible otherwise to protect traumatic surfaces, or to obtain immobility of the parts. Again, on the field of battle there is no method likely to offer greater advantages in the treatment and transport of the wounded.

M. Guerin hopes in course of time, by a modification of the process, to obtain union by the first intention in flap operations on the extremities. Experience is as yet wanting on this point.—*Lancet, April* 26, 1873, *p.* 590.

ORGANS OF CIRCULATION.

40.—THE SURGICAL TREATMENT OF ANEURISM IN ITS VARIOUS FORMS.

By Timothy Holmes, Esq., M.A., Professor of Surgery and Pathology to the Royal College of Surgeons.

Aneurisms of the inferior mesenteric artery are rarer than those of the superior—at least to judge by the fact that I have met with only a single specimen in the same museums and books which comprise nearly a dozen of superior mesenteric aneurisms. The diagnosis during life would be hardly possible; but the lower origin of the aneurism would make its treatment by pressure more easy.

Turning to those abdominal aneurisms which are situated below the bifurcation of the aorta, we have the choice of several methods of treatment. A few years ago they were always treated (if treated surgically at all) by the Hunterian operation on the aorta, the common or external iliac, according to the height to which the aneurismal sac extended. The present practice is to attempt the cure of all such aneurisms by the total and rapid compression of the great trunk (aorta or common iliac) above. Mr. Syme recently, in a case of abdominal aneurism, founding his proposal on the undoubted fact that very frequently the orifice of the aneurism is accessible far below the upper limit of the sac, proposed to revive the old operation in these cases. And this will, I think, be a convenient part of the course to discuss the propriety of reintroducing this method of treating aneurism into general practice.

The old operation, or that of laying open the sac of the aneurism and tying the artery on either side of its aperture into the sac, has been considerably more common of late years than it was during the earlier part of this century. Indeed, the first success of the Hunterian operation was so striking, its advantages in popliteal aneurism were so indisputable (and the popliteal were almost the only spontaneous aneurisms which used to be the subjects of operation), and, by means of the happy audacity of Abernethy, Astley Cooper, Aston Key, Mott, and many others who were educated in the school of Hunter, the province of operative surgery had been extended to so many arteries which had previously been regarded as inaccessible, that it was no wonder if, at first, Hunter's operation was regarded as almost perfect, and no other means of cure were sought for. Thus Hodgson says that, "the improvements which have now been effected in the mode of applying the ligature to arteries have brought the surgical treatment of aneurism to a degree of perfection which leaves little room for advancement." Lawrence speaks of the Hunterian operation for aneurism as "extremely simple, of little pain, and still less danger."

To us who have seen popliteal aneurisms cured by such simple methods as flexion of the limb, or by a few hours of pressure, such an appreciation of Hunter's operation may seem extravagant; but if we remember the almost universal fatality of the old operation for popliteal aneurism, or of amputation (as testified by E. Home, Pott, and others), we shall not be surprised that at first the Hunterian operation appeared to be the only way of treating the disease, and incomparably superior to the old operation in every case of it.

But this was soon changed, as far as certain forms of disease were concerned. John Bell, and after him Guthrie, had shown

conclusively that the ligature of both ends of the vessel was a far more trustworthy proceeding than ligature of a higher part of it in the case of a recent wound; and Guthrie, by a pardonable exaggeration very similar to the frame of mind which led his predecessors to over-estimate the Hunterian operation, himself strove to introduce the ligature of both ends of the vessel, even in situations where (as in the case of a wound of the internal carotid from the mouth) they are hardly accessible without the most grievous risk—even if they are accessible at all—and where the Hunterian ligature has often proved successful.

Reasoning both from theory and from his ample experience, Guthrie, in his lectures delivered before this College, not only showed with admirable force the method which should ordinarily guide the surgeon in recent injuries of vessels, but showed also that the same practice of incising the sac and applying ligatures on the two ends of the artery was the one which ought to be pursued in the varicose aneurisms which result from careless bleeding at the bend of the elbow, and might often be pursued with advantage in traumatic aneurism.

It is, however, to Mr. Syme that the profession in England is chiefly indebted for the renewed prevalence of the old operation. In his well-known papers on Axillary Aneurism, published in the forty-third volume of the Medico-Chirurgical Transactions, Mr. Syme opens the whole question in the following somewhat startling language:—"Some traumatic aneurisms, more especially those of the smaller arteries, were deemed proper exceptions from the new system; but, as the great leading principle of practice, it was universally admitted that the disease should be combated by ligature of the artery beyond the confines of the tumour. Such is the principle which, in common with other teachers of surgery, I have inculcated for more than thirty years, and of which I now feel it my duty to question the soundness."

Mr. Syme's opinions on this subject, at least as far as axillary aneurism is concerned, can hardly be said to be entirely novel, since the same idea of the greater applicability of the old than the new operation in this form of aneurism had been held by Velpeau. Velpeau speaks as follows:—"The method of Anel (in which term he includes Hunter's operation) has many incontestable advantages over the old operation. Yet this latter ought not to be entirely rejected. It ought to be preferred, for example, in diffused superficial aneurisms; in those which affect the brachial artery very near the axilla; in those of the axillary itself, when the shoulder is infiltrated, or so far deformed as to render it dangerous to attempt to operate in front of or above the clavicle; and in aneurisms in general, when

very voluminous, or when gangrene of the sac is threatened, or when it is in the neighbourhood of an important and large collateral branch. Finally, in varicose aneurisms it is necessary to tie the artery above and below the opening."

Roux speaks as follows:—"Almost at the same time as the first operations for ligature of the external iliac were performed in England, Scarpa published the suggestion that in a case of inguinal aneurism the operation by laying open the sac might be brought to a successful termination if the surgeon could be extremely quick in finding the vessel and applying his ligatures. He relied on extreme address and presence of mind in the surgeon at a time when even the compression of the aorta through the abdominal parietes had not been thought of as a means of suspending for some moments the access of blood to the lower limbs." "The bold operation which Desault undertook is also well known in a case of large aneurism of the axillary artery, in which, not being able to render himself master of the hemorrhage, he had the misfortune to see his patient expire under his eyes immediately after the opening of the sac."

The passage of Scarpa referred to by Roux is to be found at p. 341 of Wishart's translation. It refers not to abdominal, nor, in strictness of speech, to inguinal, but to femoral aneurism, since Scarpa makes it a condition of its performance that there should be a "sufficient tract of sound artery below the crural arch to which the ligature can be applied;" but in other respects the operation described by Scarpa exactly represents that performed by Mr. Syme. Scarpa imagines a case in which the tumour extends so high that the operator "cannot reckon on the co-operation of an assistant for suppressing the current of blood through the ruptured femoral artery," and the only respect in which his operation differs from that of Mr. Syme is that he had not thought of the possibility of plugging the wound with the hand while feeling for the orifice between the sac and the artery, and so avoiding the jet of blood which will occur on laying the sac open, and which he describes as "violent and dreadful." He seems also to regard the relation between the artery and the sac in much the same way as Mr. Syme does.

Nor was Mr. Syme's practice absolutely novel, since Sir J. Paget had performed a similar operation about two years previously, and another by Mr. Skey is related in the same paper. Still there can be no doubt that Mr. Syme's views were perfectly original, and that it is to his energetic advocacy and masterly operations that whatever prevalence this treatment has obtained is owing. Mr. Syme's second paper on the subject was published in the 45th volume of the same Transactions,

and applied to the case of an abdominal aneurism. It rested on the reasoning of the former paper; but it is in connexion with this case that the question comes more distinctly under discussion, since Mr. Syme's first case, like Sir J. Paget's and Mr. Skey's, was not, strictly speaking, an aneurism, but a case of ruptured artery; and the theoretical reasoning which Mr. Syme uses with regard to the relations between the artery and the sac hardly applies to cases in which, as far as can be judged, there was no sac at all.

That reasoning will best be given in Mr. Syme's own words: —"In every aneurism, whether large or small, traumatic or spontaneous, the aperture of the artery is situated towards the centre of the tumour, so that a portion of the vessel, longer or shorter according to the size of the sac, is contained within its cavity, or rather embraced by its wall. Thus, in a very large aneurism ascending from below the groin nearly to the umbilicus, for which I tied the common iliac, the arterial opening was found to be only a little higher than Poupart's ligament; and it might always be expected to possess this relation to the cavity when the process of formation is kept in mind. It has become a long-established and generally-received principle in surgical pathology, that the extent of artery thus enclosed in the aneurism, or rather comprehended by its sac, is unsound and unsuitable for ligature, while the vessel beyond the confines of the tumour is free from any participation in the disease. But when this opinion is fairly examined it will be found void of any good foundation, since the artery, though in some measure isolated from its neighbouring connexions by the effused blood, still retains the same relation as before to its sheath, and consequently, receiving a full supply of nourishment, is nowise unfitted for the process of obliteration by ligature. Indeed, when we trace the progress of an aneurism from its small beginning to a large size, it appears inconsistent with reason to consider the vessel sound so long as it can be felt beyond the tumour, and diseased so soon as it becomes overlapped or enclosed by the expanding sac. Whether the case be traumatic or spontaneous, there thus does not seem to be any reason for looking upon the portion of artery in question as unfit for being the subject of operative procedure. Under the influence of this consideration I have treated all the aneurisms at the bend of the arm, resulting from wounds of the humeral artery through venesection, which have come under my care, amounting to ten in number, by opening the sac, and applying ligatures on both sides of the aperture. Proceeding upon the same principle, in a case of carotid aneurism caused by the thrust of a knife at the lower third of the throat, and which extended from below the clavicle upwards, I did not scruple to lay open the cavity,

and while hemorrhage was restrained by pressure of my finger, to tie the vessel above as well as below the aperture, with the happy result of saving the patient's life."

Again :—"The doctrine usually taught is, that the whole extent of an artery included by the aneurismal sac should be deemed of suspicious soundness if, indeed, not entirely absent, unless the case is traumatic, or proceeding from a wound of the vessel, which, of course, does not imply any morbid condition of the coats; while the spontaneous form, occurring without any assignable cause, or resulting from such injuries as blows and sudden extension, has been held to do so. But even although it were granted that an origin of the latter kind affords ground for suspecting unsoundness at the ruptured part, it by no means implies a similar condition throughout the whole extent of the tumour. For the sac enlarges quite independently of any change in the vessel, and, so far from weakening or destroying its coats, rather tends to consolidate and support them by increasing the density of the surrounding parts. If, therefore, an artery is considered sound beyond the limits of an aneurism of the size of an egg, it should still be so regarded after the tumour enlarges to the bulk of an orange, or any greater magnitude, the extent of arterial disease being in no wise proportioned to that of the aneurismal sac. Proceeding upon this principle, and trusting to find a sound portion of artery within the sac, I have repeatedly operated with success by laying open the cavity, and securing the orifice by ligatures. Of the cases thus treated, certainly the most remarkable is that which I am about to relate; and it so strongly supports the position in question, that any further evidence in its favour would seem hardly to be required."

Sir A. Cooper, in his attempt to perform the old operation in the case where he afterwards tied the aorta, was guided by a similar view of the usual (he does not say the universal) state of things in aneurism. "I determined to ascertain whether it were practicable to pass a ligature around the artery from within the aneurismal sac; for I was of opinion that if the artery had given way near the centre of the sac, as it usually does in aneurisn, I might compress it with my finger, and pass a thread around it."

On the other hand, the very basis on which the theory rests is thus directly assailed by Mr. Henry Lee in the same volume in which Mr. Syme's case of successful operation on an abdominal aneurism by the old operation was related. "An examination of the preparations of aneurisms of the larger arteries, as they exist in the museums of London, will show that the very great majority of these are of the fusiform character, formed by the dilatation of all the coats of the vessel,

The cases in which the artery, of its natural size, is to be found running by the side of a portion of the sac, in such a position as to admit of a ligature being applied to it, are very exceptional. It would, therefore, appear that the operation which has lately been described can be applicable to a very limited number of cases; and that, if repeated, the surgeon would, in a very great majority of instances, find only 'a chaos of broken coagula,' as happened in Sir A. Cooper's operation."

The controversy, I think, resolves itself into the following questions:—1. Is it true, as Mr. Syme says, that in every aneurism there is only a limited portion of the vessel contained within the cavity of the sac or embraced by its wall? 2. Is that limited portion capable of supporting the ligature and taking on reparative action? 3. Can the operation be performed with confidence on the part of the surgeon that he will complete it? 4. And, finally, admitting all this is so, is it a preferable method to the other ways of treating a given case?

[After discussing these questions in his next lecture, Mr. Holmes says:]

The evidence before us justifies the following conclusions:—

1. That the relations between the artery and the sac which Mr. Syme represented as being universal, are not so. That there are many cases in which, the aneurism being of the tubular variety, the two openings are separated by an unknown distance, so that it would be very difficult, or perhaps impossible, to find them; and that there are others of the sacculated form in which the portion of artery embedded in the sac is so extensive, and the sac so thick, that it would be very difficult to tie the artery.

2. That in spontaneous aneurism, especially abdominal, it must always remain doubtful whether the portion of artery so tied will bear the ligature.

3. That in aneurisms which grow rapidly in large cellular spaces, such as those of the abdomen, it must always remain doubtful whether, in an operation of this kind, the surgeon will succeed in finding the artery; that usually his only chance of doing so will be by laying the cavity open most freely, perhaps in the whole of its extent, and that this cannot be done without unjustifiable rashness, unless the aorta is secured by compression.

4. That on this account the old operation can hardly be applied, except to aneurisms which as a rule will be amenable to the far more safe though less certain treatment by compression.—*Lancet, Feb.* 8 *and March* 1, 1873, *pp.* 195, 296.

41.—CASE OF POPLITEAL ANEURISM CURED BY DIGITAL COMPRESSION IN EIGHT HOURS.

Under the care of Wm. Mac Cormac, Esq., Assistant-Surgeon to St. Thomas' Hospital.

George T., aged 64, painter, admitted August 31, 1872, for pulsating tumour in left popliteal space. Patient states that thirty years ago he fell from a ladder and fractured left patella, for which he was under treatment at St. Bartholomew's Hospital for four or five weeks. He has since been unable to flex his leg thoroughly, but beyond this has felt no inconvenience. Fourteen years ago he fractured the left femur, and was under treatment at Westminster hospital four months. About three weeks before admission he slipped and sprained his left leg; this scarcely attracted his attention until three or four days after, when he noticed a small tumour at bend of left knee.

On admission the patient was found to have a large pulsating tumour, about twice the size of a hen's egg, in the left popliteal space. Pulsations correspond with pulse, and cease when femoral is compressed. The arteries in arm and leg are tortuous and cord-like. The brachial arteries appear quite subcutaneous, very hard, incompressible, and tortuous, and may be seen almost throughout their entire extent.

September 2. Noon: Digital compression to femoral artery commenced by a relay of dressers, ten minutes each; the pressure kept up unintermittingly for eight hours. 2.30 p.m.: Foot and leg cold. Aneurism smaller; it has a soft feeling. Hot baths to feet. 3.30 p.m.: Leg becoming congested and swollen. Cotton-wool and bandage to leg. 4.30 p.m.: Very excited. Tumour considerably diminished, much harder, and pulsations less. 8 p.m.: Digital compression discontinued; pulsation in tumour entirely stopped. Signorini's tourniquet applied to femoral artery at apex of Scarpa's triangle, and gentle pressure employed to modify current of blood. Temperature of left foot is now higher than the other. During the progress of the treatment by compression, and also a few hours after, he was considerably quieted and composed by the injection of morphia (gr. $\frac{1}{3}$) subcutaneously at four different times—a grain and a half was injected in twelve hours.

3rd. Slept well. Temperature of left leg, 100°; right, 98·4°; axilla, 101·4°. No perceptible pulsation in tumour; congestion of left leg has subsided; left femoral can be felt pulsating in Scarpa's space, and the articular arteries enlarged. Hot bottles to feet continued.

4th. Rather restless early part of night. Repet. morph. inject. gr. $\frac{1}{3}$. Tumour still hard; no pulsation. 1.30. a.m.: Tourniquet discontinued.

5th. Tumour softer and smaller; some slight abrasion of skin from tourniquet, which was discontinued. Temperature of left leg lower than right.

9th. Extremities of all the toes (second excepted) discoloured. Temperature of the left foot higher than right.

12th. Line of demarcation appearing.

17th. Gangrene of toes not extending, except that of great toe; tumour about the same. Patient rather feverish.

21st. Extremities of toes blackened. Complains of considerable pain at night. Inj. morph. hydrochlor. gr. $\frac{1}{3}$.

October 7. Charcoal poultices applied to foot. Mixed diet, beef-tea, wine, &c. Complains of pain in heel and left foot; leg placed on Liston's back splint.

November 1. Gangrene has extended to distal extremity of first phalanx of all the toes except second, and there is some sloughing of heel.

December 5. Gangrene quite limited; dead parts nearly separated; sloughing over outer and back part of heel has extended down to bone. Linseed-meal poultices now applied over the granulating stumps of toes, &c.

Result. The patient is still in hospital on account of the tardy healing of the stump of the great-toe The aneurismal tumour has quite disappeared, and his general health and condition are much improved. With arteries so seriously diseased as they evidently were in this case, the treatment by compression was the only method likely to succeed. The ligature would probably have been followed by secondary hemorrhage.—*Medical Times and Gazette, Feb.* 8, 1873, *p.* 140.

42.—A NEW MODE OF APPLYING PRESSURE IN POPLITEAL ANEURISM.

By Dr. Henry Thompson, Surgeon to the Tyrone Infirmary.

Some years ago, having had occasion to treat a case of popliteal aneurism, and neither possessing, nor having any means of procuring within the necessary time, the clamps and other appliances hitherto employed for the purpose, I was obliged to devise some plan by which the object could be accomplished by the means that were at my disposal, and, after some little thought I adopted an apparatus similar in principle to that of which a woodcut accompanies this brief notice. Precluded from the use of the screw, I did not see why another of the mechanical powers, the lever, might not be brought into requisition, particularly as by a simple expedient, well illustrated in the woodcut, it would be easy to adapt it to Carte's principle of elastic pressure.

The plan was found quite successful, as far as its power of controlling the circulation through the femoral artery was concerned, and would certainly have effected a cure, had the other circumstances of the case admitted of it; but the patient had a thoracic aneurism, accompanied with a diseased state of the blood, which prevented coagulation, and of which he ultimately died.

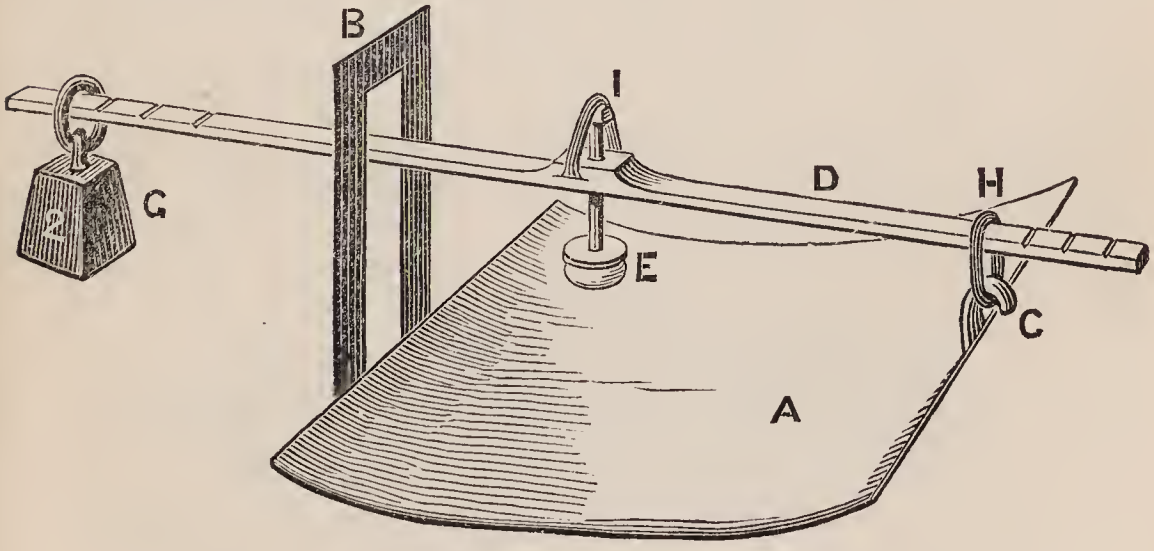
The progress of the external aneurism was, however, so materially checked by the use of the instrument as to prove its power of doing all that was requisite under more favourable conditions.

Within the past two months another case has occurred to me, which has given me an opportunity of verifying my anticipations, by the production of a complete cure of a popliteal aneurism by the use of this instrument alone. I have, therefore, no further hesitation in recommending it to the profession, as possessing some advantages over those hitherto in use:—

First, It adopts the principle of elastic pressure to the fullest possible extent.

Second, It is easily made by anyone who can cut sheet iron; and

Third, It can be watched and managed by the patient himself with the greatest ease and comfort.



Dr. Thompson's Instrument for the Treatment of Popliteal Aneurism.

As illustrated by the woodcut, the instrument consists of A, a piece of sheet-iron, 14 inches by 10, hollowed and padded to receive the pelvis, and furnished with B, a portion of the same piece of sheet-iron turned up perpendicularly, and a slot cut in it to receive the lever. C, another piece of the sheet-iron exactly opposite the slot, turned up and bent down into a hook, to hold a strong elastic ring. H, to form the fulcrum. D, the

lever, a thin lath of deal 2½ feet long, ¼ inch thick, and 1½ inch wide, with a square mortice cut in it at I, where its thickness should be doubled. This mortice is to receive the stem, which supports the compressing pad E, and the opposite end of the stem is fixed to the sides of the lath by a stout piece of elastic band which passes over the end of the stem and is tacked to the sides of the thick part of the lever. G is a two-pound weight slung over the free end of the lever, forming the compressing force, which can be increased or diminished by moving the weight out or in. The position of the pad on the vessel can also be changed as required by moving the pelvis an inch or two up or down, which the patient soon learns to do for himself, without relaxing the pressure on the artery. With this apparatus I have kept up continuous pressure for 12 hours without interruption.—*Dublin Journal of Medical Science, March* 1873, *p.* 229.

43.—ACUPRESSURE; WITH A DESCRIPTION OF A MODIFICATION.

By Dr. J. C. Ogilvie Will, Aberdeen.

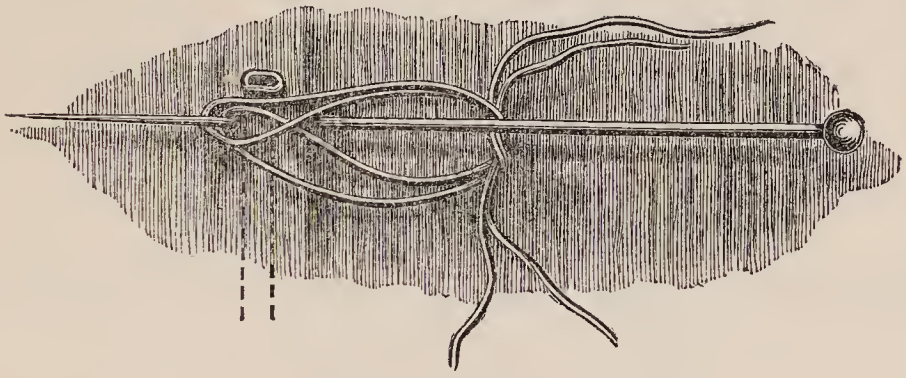
Having attentively watched the progress of acupressure for nine years, during which period I have seen several thousand vessels acupressed, and having had ample opportunities of carefully comparing it with the various methods for arresting surgical hemorrhage resuscitated or invented since Sir J. Y. Simpson's introduction of temporary metallic compression of cut vessels, and having seen that the results obtained where acupressure has been used are infinitely superior to those where torsion, or silk, or carbolised catgut ligatures, aided by multifarious carbolised dressings, have been employed, I am naturally anxious to do anything to aid its advance. With this aim I purpose bringing before the profession a slight modification of acupressure, which will, I trust, from its simplicity and evident security, find favour with such surgeons as are desirous of employing a hæmostatic which can easily be withdrawn when the period has arrived after which the presence of any foreign body in a wound, instead of adding to the patient's chances of recovery, must certainly militate against it.

Many surgeons, both British and foreign, have informed me that they entertained insuperable objections to the use of the wire in the method now called "circumclusion," on account of the danger of disturbing the clot, and also on account of the disturbance of the tissues caused by the "corkscrew" of wire during its withdrawal; they also stated that, as the other methods suggested did not seem to them to be sufficiently

reliable, they did not feel warranted in giving up the use of the ligature in favour of acupressure.

To obviate this difficulty I now suggest, as a substitute for the wire, ligatures made of silk, well waxed and soaped, or catgut. The method of application will be easily understood by a glance at the accompanying engravings, assisted by the following short description.

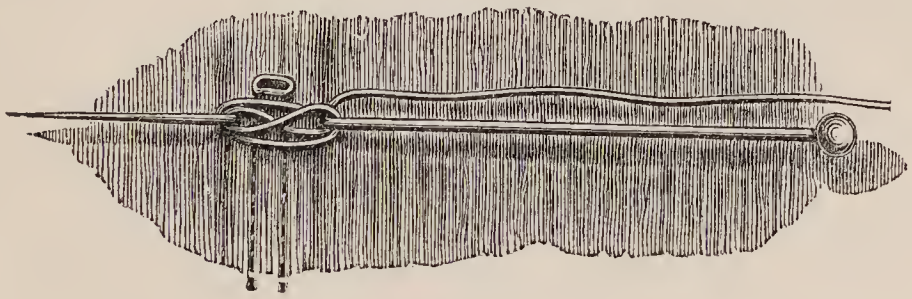
Pass a pin underneath the vessel to be secured, making its point emerge a line or two on the other side of the artery; take two loops of ligature, place first one, then the other,



Mode of Application.

over the point of the pin, bring them in front of the vessel, and tie by the usual surgical knot behind and a little to one side of the pin; lastly, cut off three ends, and bring out the remaining one by the side of the pin.

Two loops may seem unnecessary, but it is not so; for, when only one is used, it takes such firm hold of the tissue about the vessel that, during its removal, the safety of the clot is endangered.



Completed.

To withdraw: First remove the pin by a gentle twisting motion; after which, the knot being liberated, the ligature can be readily pulled out. I may here observe that the ligatures depicted in both sketches are rather more "rope-like" than I intended; and in the second they appear to be less tightly drawn than would be desirable when in actual operation.

The advantages of this method are: 1, reliability; and, 2,

the slight disturbance caused to the vessel and other parts during its removal. The only drawback to its use is the possibility of irritation being excited by the ligature; but as its sojourn in a wound would be of so short duration, such an objection could hardly be sustained. I would only advocate the use of filo-acupressure—if I may so call it—in the case of the larger vessels; retroclusion, which Sir James Simpson often told me he considered the best of all modes when a pin alone was to be used, and, perhaps, torsoclusion, being employed for the smaller. I need only name these methods, as a full description of them may be found in an exhaustive paper on Acupressure by Professor Pirrie in the Lancet, June, 1871. (See *Retrospect*, vol. lxiv. p. 194.)—*Lancet, April* 12, 1873, *p.* 524.

44.—CASE OF ANEURISM OF THE ARCH OF THE AORTA TREATED BY GALVANO-PUNCTURE.

By Dr. McCall Anderson, Professor of the Practice of Medicine, Anderson's University; Physician to the Glasgow Royal Infirmary.

[The subject of this paper is a case of aneurism of the thoracic aorta, at the time under treatment at the Glasgow Royal Infirmary, by means of galvano-puncture.]

In this operation I employed a Stöhrer's battery, and a needle insulated to within half an inch of its point by being coated, as recommended by Dr. John Duncan, of Edinburgh, with a mixture of shellac and gutta percha.* The operations were performed thus:—The skin at the edge of the aneurismal swelling having being frozen with ether with the aid of Dr. Richardson's spray-producing apparatus, the needle, connected with the positive pole, was passed obliquely into the aneurismal sac. A zinc plate, connected with the negative pole, was then applied to the chest-wall on the opposite side and about three inches beyond the edge of the swelling, a sponge wrung out of warm salt water intervening between the plate and the skin. The cells of the battery were then raised in the usual way, and the traveller pushed up so as to bring four, six, or eight cells into use. When the process was completed the traveller was slowly pushed back, the zinc plate removed from the skin, and the needle extracted, a piece of plaster being applied over the puncture. The following are the notes of the case:—

Mrs. H., aged forty-six, married, mill-worker, was admitted under my care into the Royal Infirmary on the 8th of November, 1871. She appears to have always enjoyed good health

* This gentleman seems now to prefer insulating the needles by vulcanite.

until about two years and a half before this time, when, without any obvious cause, she began to complain of a "violent beating at her breast" and of hoarseness. About four months after the onset of the palpitation she first experienced a sensation as if a heavy weight were pressing upon her chest, and complained of lancinating pains between the shoulders, which extended down the left arm, and which gradually increased in severity. About eighteen months previous to admission she observed a swelling in the front of the chest, which was then about the size of a small hen's egg; it extended gradually at first, but much more rapidly during the last six months of this time. From the time of appearance of the tumour the palpitation became more marked, being also aggravated by movement; and dyspnœa set in so as to prevent her from lying with any degree of comfort save on her left side.

On examination her general health seemed to be good, although she was rather pale and had an anxious, suffering expression of countenance. On inspection of the chest the swelling above referred to was seen at the lower and inner part of the left infra-clavicular space and implicating also the upper sternal region. It was about three inches and a half in diameter, and its apex—for it was somewhat conical—was about an inch and a half above the surface. Pulsation and expansion could be distinctly seen and felt, and palpitation elicited well-marked purring tremor over it. There was decided dulness, and percussion required to be done very gently, as the part was exceedingly tender. On auscultation, a well-marked systolic murmur was discovered, which was audible over a pretty extensive area, but was most distinct over the tumour. The left ventricle was the seat of dilated hypertrophy, the apex-beat being too extensive, and decidedly lowered and carried to the left, the impulse of the heart being strong and heaving, and the area of præcordial dulness increased in a downward and outward direction. There was no evidence of pulmonary complication, and, although there was considerable dyspnœa, the air entered both lungs pretty freely. The pulse was regular, but rather soft; it lagged preternaturally behind the ventricular systole; and the left pulse was rather weaker than the right both in the radial and carotid arteries. The pupils were not affected, and she had no difficulty of swallowing; nor was there any evidence of emaciation or trace of spasm of the glottis, although the voice was hoarse. Her appetite was fair, and her bowels regular; she had no fever, but she slept badly.

She was kept in bed, absolute repose, both mental and physical, being enjoined, but not very successfully enforced; and twenty-five grains of chloral every night, and ten grains of the

iodide of potassium three times a day, were prescribed. Her diet was plain but nourishing, her bowels were carefully regulated, and stimulants were forbidden.

Within a fortnight from the commencement of the treatment the pains in the shoulders had in great measure disappeared, and she was sleeping well. The chloral was accordingly stopped, but the iodide of potassium continued.

On the 22nd of December, notwithstanding the pushing of this medicine, the tumour was evidently getting larger and softer. Accordingly, a bladder filled with a mixture of pounded ice and salt was ordered to be applied over the swelling for half an hour twice a day, dusting powder, composed of oxide of zinc, lycopodium, and camphor, being employed in the intervals to prevent irritation of the skin.

The freezing mixture promised well at first, for on the 31st January, 1872, it was noted that all pain had disappeared, except when a deep inspiration was taken, and she could lie in any posture. The patient thought the tumour decidedly smaller: it was certainly firmer and much less tender, and purring tremor could no longer be felt over it, but otherwise there was little change.

Matters continued much in this state for some time, but during the month of March it was observed that the swelling was becoming gradually more prominent and softer, and by the end of the month it was evidently a question of days only when the red blush would appear upon the skin as a prelude to the fatal rupture. It was therefore determined, as a last resource, to try the effect of galvano-puncture.

On the 4th of April, all other treatment having been stopped, and with the kind co-operation of Drs. Perry and Finlayson, the operation was performed for the first time. It was continued for half an hour, four cells being employed for the first quarter of an hour, six for the second. For a short time after it there was slight expectoration which was tinged with blood, but the patient did not keep quiet as she had been told to do. Two days afterwards the swelling was found to be firmer, and she could take a deep inspiration almost without any pain.

On the 9th of April galvano-puncture was employed for the second time, and was unattended by hemorrhage or complication of any kind.

On the 26th of April the following note was taken:—"The result of the two operations has been satisfactory. The patient now complains of no pain, and she can take a deep inspiration without any uneasiness. The tumour is decidedly smaller, and for the most part firm and solid. It still pulsates however; and the systolic murmur, though not nearly so pronounced, is still present. At its middle and lower part, too, there is a

decided want of solidity, and here the pulsation is most distinct."

The operation was, therefore, repeated, the needle being passed into the soft part of the swelling.

On June 11th the following report was taken :—"Since last operation the improvement has been very marked. The tumour is now firmer at the lower part, is diminishing in size, and the pulsation is becoming less distinct. The murmur continues as before the last operation."

About this time she caught cold, and the cough, which lasted a couple of weeks and was pretty severe, was accompanied at first by hæmoptysis, about a wineglassful of dark-red blood having been expectorated in all.

On the 8th August the aneurismal symptoms remained unaltered, but the patient complained a good deal of palpitation and of irregular action of the heart. On this account tincture of veratrum viride was tried, at first in three, and latterly in ten-drop doses thrice daily, which moderated somewhat the violence of the cardiac action, while the feeling of iregularity vanished.

On the 27th August galvano-puncture was again made use of, six cells being employed for the first quarter of an hour, eight for the following five minutes, and six for the last ten minutes. The battery, having been recently reamalgamated, acted more powerfully than formerly, so much so that when eight cells were used she complained of decided uneasiness. She felt as if the needle was very large, and the left arm swollen and very tight; she also felt oppressed, complained of a burning heat in the chest, and had the feeling as if she could not survive if the current was not moderated. These symptoms passed off whenever the number of cells in use was reduced from eight to six.

The result of this operation was, that the swelling was further reduced in size and rendered firmer.

On the 26th October the following report was taken :—The symptoms of dilated hypertrophy of the left ventricle remain as at the period of admission into the infirmary, but for some time an apex systolic murmur has been audible, distinct from the basic one, and which was either not present at an earlier date or was obscured by the aneurismal one. The tumour is now only about one quarter of its size before galvano-puncture was resorted to; and it is for the most part very solid, much more so than the surrounding healthy parts of the chest. There is no trace of purring tremor, and its pulsation is much diminished, though still distinct, especially in the central, softest part of the swelling. The systolic murmur, too, is still present, although it is much softer than formerly. There is no

change in the pulse. Patient feels in the most perfect health, and her only complaint is of a feeling of pulsation within the chest.

As far as I am aware galvano-puncture has only been employed on two other occasions in this country in cases of aneurism of the arch of the aorta. Both of them were under the care of Dr. Duncan, but in neither was the operation successful. It was performed twice in each case. In the first case the treatment was apparently commenced too late, for external hemorrhage had set in, and the patient died of exhaustion eight days afterwards. In the second case, the patient died from external hemorrhage two months after the first operation, but in this case the treatment did not get fair play owing to the distance from Edinburgh at which the patient resided. A few other cases have been recorded by other observers; thus Beard and Rockwell, in their excellent work on electricity, state that Nicolli was successful in two cases of aneurism of the aorta, although they give no details of them; and Dr. Althaus, in his Treatise on Medical Electricity, reports the following case of aneurism of the descending aorta, cured by Ciniselli:—The patient, aged forty-six years, had a round, pulsating tumour on the right side of the sternum, in the third intercostal space; it was six centimetres wide, and almost equally long, and was elevated about one centimetre and a half above the level of the walls of the thorax. Ciniselli believed it to be an aneurism of the lateral portion of the aorta descendans thoracica, and used for its cure three steel needles one millimetre thick, which were introduced into the third intercostal space, one being about two centimetres distant from the other. The positive pole was first connected with one of the needles, and the negative with a sponge-holder applied to the skin in the neighbourhood of the tumour. He then connected the positive pole with the second needle, and the negative with the first, where the positive pole had already acted, &c., until each needle had been in contact with both poles. The application lasted forty minutes; the skin had become reddened and swollen. After a few days these local symptoms abated; there was no general reaction. Sixty-six days after the operation the patient was completely cured.

In carrying out this treatment our aim should be to induce partial coagulation within the sac, in the hope that it may be followed by the slow deposition of successive layers of fibrine; for sudden coagulation is apt to induce inflammation and sloughing, while such clots are of necessity soft and easily detached so as to incur the risk of embolism. It is right, however, to state that, as far as I am aware, this has hitherto proved rather a theoretical than a practical source of danger.

The needle employed was insulated with the view of preventing cauterisation of the skin and subjacent tissues, which might lead to inflammation or hemorrhage. Althaus thinks that such insulation is unnecessary, and that a slight action upon the skin is rather useful than otherwise by promoting shrinking of the sac, and preventing hemorrhage on removing the needles. Each of these opinions is, in a sense, correct; everything depends upon the strength and duration of the current; for, if the current is weak and not much prolonged, insulation of the needles is probably unnecessary, while, if the current is strong and long continued, its omission might prove dangerous. At the same time it must be borne in mind that, while inflammation should be avoided if possible, its occurrence, when moderate in degree, is not an unmixed evil, for it seems often to promote the cure.

In conclusion, let me say that I do not regard the case which I have related to you as an instance of perfect cure; but, at the same time, no one can deny the vast benefit which the patient has derived from galvano-puncture. For, although there is still decided fulness and pulsation, and slight murmur at the seat of the disease, she has neither ache nor pain, but says that she is in the most perfect health, and desires to be dismissed from the hospital and to resume work; whereas, had this treatment not been carried out, she would undoubtedly long ere this have been in her grave.—*Lancet*, *Feb.* 22, 1872, *p.* 260.

45.—PLUGGING THE POSTERIOR NARES.

By Dr. R. P. B. Taaffe, Brighton.

Having on several occasions had to plug the posterior nares for epistaxis, and having once or twice (owing to the peculiar formation of the parts at the back of the mouth and fauces) found great difficulty in drawing up the plug from the mouth into the posterior nares, and having to use some force with the finger to push the plug up behind the soft palate, it struck me that a method might be adopted whereby the posterior could be plugged from the anterior nares, and so avoid the inconvenience and difficulty above-named, and also prevent the alarm created in the patient's mind at having a plug drawn into the posterior nares through the mouth. With this view Messrs. Weiss have had made for me an india-rubber nasal-bag of a pyramidal form. The lesser end being drawn into a small tube, the larger end can be introduced into the anterior nares, folded round a metal director and passed beyond the posterior nares. The director can now be withdrawn and the bag dilated with either air or iced water by means of a syringe; a ligature

being placed round the end of the tube, the syringe can now be detached, and traction being applied to the end of the tube, the nasal-bag plug can be drawn forwards so as to plug the posterior nares. In order that this may be done effectually, an inelastic band is let into the fabric of the tube and bag, so that good traction may be used without the material of the tube or bag becoming elongated or stretched. By this means I believe very firm pressure may be made against the walls of the nares, and so effectually plug the latter. In applying this bag I intend to cover it with an outer bag of lint which has been soaked (and afterwards dried) in a strong solution of tannin, alum, matico, or perchloride of iron.

The nasal-bag plugs should be made in three sizes. There is figured in Messrs. Weiss's catalogue an instrument for epistaxis, invented by Martin P. Ange, which consists of a loose bladder or bag to be filled with water; I am not aware that this instrument has been largely adopted or found successful.

Should any of my professional brethren think fit to make a trial of these nasal-bag plugs (which can be procured from Messrs. Weiss), I shall feel much obliged by their publishing the result.

The nasal-bag plugs are inexpensive, and can be dilated by an ordinary brass ear-springe. The tube can be either ligatured or fitted with a stop-cock, but the ligature is the most simple and least expensive, and answers all purposes. A metal director is supplied with the nasal-bag plugs.

I must add that I was aided by, and followed out in some measure, the form of uterine dilators invented by Dr. Barnes, and figured in Weiss's catalogue.—*Lancet, Jan.* 7, 1873, *p.* 32.

46.—AN IMPROVED MEANS OF PLUGGING THE POSTERIOR NARES.

By A. Godrich, Esq., M.A.

I beg to submit to professional notice an instrument that I have had constructed by Messrs. Louis Blaise and Co., of 67, St. James's Street, for plugging the anterior and posterior nares in cases of epistaxis. I have long been struck by the unsatisfactory means at our disposal in dealing with such cases. There is, in the first place, owing to its large curve, no little difficulty in passing Bellocq's sound, the point of the instrument often hitching on the posterior edge of the floor of the nasal fossa. In the next place, the adjustment of the posterior plug, requiring, as it does, the passing of the surgeon's finger into the fauces, not only causes much distress to the patient, but often

entails a more or less severe bite on the operator, as I have found to my cost; and, lastly, when the plug is in position, the string passing from it through the mouth causes so much irritation of the soft palate and fauces, that but few patients have the courage to submit to it.

The instrument consists of a small elastic bag stretched on the end of a hollow style, by means of which it is pushed through the nasal fossa into the pharynx. It is then dilated with ice-cold water by means of the ordinary ear-syringe, the nozzle of which is inserted into a piece of india-rubber tubing tied to the other end of the style. A small piece of thread or twine tied round this prevents the water from escaping. The bag, thus dilated, is now to be drawn well forward into the posterior nares, into which, by its elasticity, it will accurately fit. The anterior india-rubber plug is next to be slid along the style (this is more easily done if the style be previously wetted) into the anterior nares, which it fits like a cork. The cohesion between this plug and the style will, I think, be sufficient to hold both plugs in position; if not, a piece of string tied round the style in front of the anterior plug will ensure perfect security.

When it is necessary to remove the plug, all that the surgeon has to do is to cut the string tied round the piece of india-rubber tubing, when the water will be expelled by the elasticity of the bag, and the instrument may be removed without difficulty.

The instrument, even at its thickest end, where the elastic bag is stretched over the style, is not larger than a No. 6 catheter; and it can consequently be passed through the nasal fossa without the least difficulty, and with very little discomfort to the patient, as I have proved by frequently passing it through my own nose. The style being made of elastic material—in fact, a gum-elastic catheter, and therefore capable of being bent to any curve required—also facilitates the introduction of the instrument. When once the instrument is in position, and quiet, it is almost impossible to tell by the sensation alone that there is any foreign body in the nasal fossa at all; the dilatation of the bag causing but little discomfort, being above the sensitive soft palate and fauces.

In designing this instrument, it has been my object to combine simplicity and cheapness with perfect efficiency. If I have not fully accomplished my object, I ask any one to suggest any alterations that may bring this instrument nearer to perfection, and enable us to do away with our present barbarous and unsatisfactory plan of plugging the nares.—*British Medical Journal, April* 12, 1873, *p.* 400.

ALIMENTARY CANAL.

47.—REMOVAL OF THE ENTIRE TONGUE FOR CANCER BY THE GALVANIC ECRASEUR.

By Walter Whitehead, Esq., Surgeon to St. Mary's Hospital, Manchester.

Mrs. S., aged sixty-nine, from Oldham, presented herself to my notice on November 29th, 1872, suffering from cancer of the tongue. The primary nodule was detected more than a year ago in the right lateral half of the tongue, within an inch from the apex, and thence it had extended beyond the median boundary to the left side and backwards to the margin of the papillæ circumvallatæ. The surface of the indurated portions was ulcerated, and bore the characteristic features of cancerous origin. The excruciating pains, swelling, and inconvenience suffered by the patient were also those usually attendant on cancer of the tongue.

An operation for the removal of the tongue was arranged for December 4th. The patient being completely under the influence of chloroform, the tongue was firmly drawn upwards and forwards during the operation by a ligature which was passed through the tip. A loop of the galvanic écraseur wire was then passed into the mouth by a needle in the central line, midway between the jaw and the os hyoides, in close proximity to the tongue. The loop was then passed over the tongue into the sulcus in front of the epiglottis, and retained in this position by means of the forefinger of each hand until the wire had obtained firm hold of the structures within its grasp. At this stage, and not before, the galvanic circuit was made complete, and the platinum wires allowed to become sufficiently hot to give unmistakable indications of burning animal matter. A single turn of the écraseur screw was made every half minute, and during each pause the galvanic current was interrupted. About eleven turns of the écraseur sufficed to remove the tongue. No bleeding occurred either during or succeeding the operation, and immediately after the effects of the operation had passed off, the patient sat out of bed for a quarter of an hour.

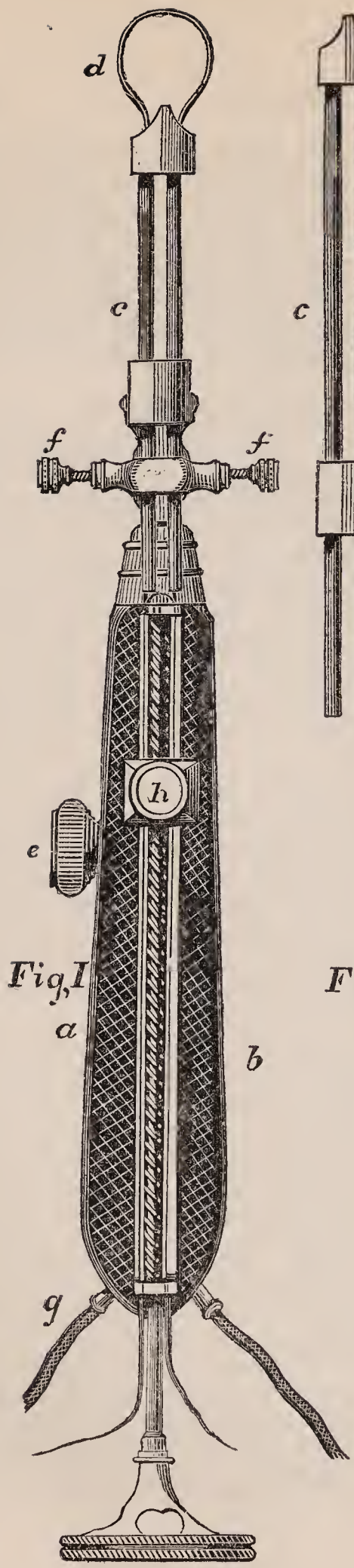
For the first two days she was fed with warm milk, which she easily swallowed after it had been conveyed to the back part of the mouth by means of an ordinary glass syringe. Afterwards she was able to take fluid food naturally. A large slough separated from the floor of the mouth at the end of the second week, and a small slough came away from beneath the

jaw about the same time; the latter left a fistulous communication with the mouth, through which the saliva escaped to an inconvenient degree. It however gradually contracted, and is now entirely closed. At the end of three weeks the patient returned home so far recovered as no longer to require further attendance. She was able when last seen Jan. 28th, 1873, to articulate with admirable distinctness; and admitted to being free from all pain, and perfectly satisfied at having undergone the operation.

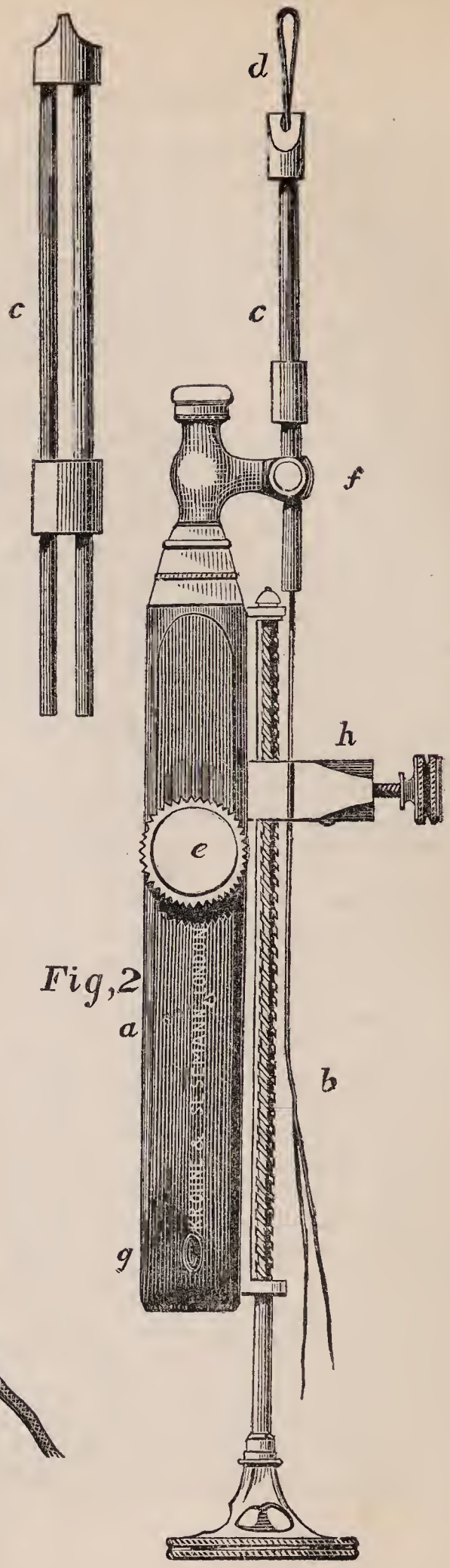
The écraseur used in this operation fulfilled all the requirements of an ordinary wire écraseur, and the combination of the galvanic cautery left nothing to be desired. The only objection to the operation, as performed in this instance, was that occasioned by the heated wire burning the structures in its course into the mouth; and this for the future ought to be obviated by dividing, according to the plan of Sir James Paget, the mucous membrane and structures connecting the sides of the tongue to the jaw, and also the attachments of the genio-hyo-glossi to the symphysis, close to the bone; and when the tongue is thus freed and drawn forwards, by adjusting the wire of the écraseur, so as to include the whole of it close to its connexion with the hyoid bone.

Removal of the tongue in the restricted sense—that is, without attempting the entire extirpation of its deeper attachments to the hyoid bone—is one of almost absolute safety, and invariably followed by an alleviation of the unparalleled suffering caused by cancer of that organ, and it appears doubtful whether the more extended operation is warranted by any adequate benefits that can be fairly promised to the patient. When we take into consideration the great mortality which has followed extirpation of the tongue in its strict entirety, involving as it does either division of the lower jaw or the extensive submental incisions of Regnoli, with a mortality in the former instance of little short of 50 per cent., and in the latter certainly 25 per cent., it requires a full belief that cancer of the tongue may be local in its origin, and curable by removal, to justify the major operation. Regulating our motives and actions by the stern facts gathered by experience, our operations for cancer of the tongue, as in cancer elsewhere, only aim at a mitigation of suffering, and a limited prolongation of life. With this conviction the galvanic écraseur can be recommended as answering every purpose for removal of the tongue.

One advantage over the knife which may be claimed for the galvanic écraseur is the amount of destruction the heat occasions to the structures contiguous to the part removed—an action which cannot fail to modify, for a considerable depth, the tissues which might also be infected with the disease.



Fig, I



Fig, 2

A feature in the case recorded worthy of mention is the facility experienced in adjusting the écraseur wire by means of the forefinger of each hand, and the retaining of it *in sitû* until the screw of the écraseur is tightened. Various ingenious instruments have been devised to effect this object, but that the most successful of these instruments can be proved as reliable as the finger has yet to be demonstrated. The finger can not only apply the wire, but it can ascertain whether the adjustment is correct; or if in fault, remedy the mistake before any irregularity can be committed.

The speed at which the screw of the écraseur is turned is of importance, so far as the prevention of hemorrhage is concerned; and the best rule to follow is—the less the resistance the slower the speed, and *vice versâ*, the resistance being in an inverse ratio to the vascularity.

It is the custom of some surgeons not to administer chloroform before the écraseur has been tightened so as to fix the loop round the base of the tongue, with the belief that up to this point there is but little pain, and that the voluntary efforts of the patient materially assist the surgeon. On the other hand, it is asserted that when voluntary assistance is of the most use, the pain caused by manipulation is the greatest, and that after the ecraseur is firmly tightened the pain is diminished. Consequently, it is much to be preferred that the patient should be thoroughly under chloroform from the first, when the absence of resistance will be at least equal to any assistance the patient could afford were he not unconscious.

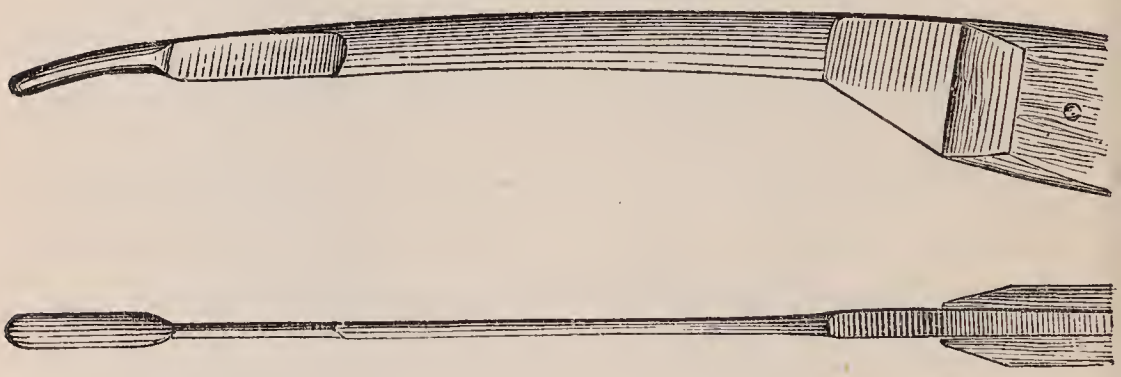
Fig. 1, Galvanic Ecraseur; *Fig.* 2, Side view.—The accompanying electrotype conveys a full representation of the several parts of the galvanic écraseur, as made by Messrs. Krohne and Sesemann. The instrument consists of four separate and separable parts:—*a*, the handle; *b*, a screw on which travels a clamp (*h*); *c*, canulæ through which the wire passes; *d*, platinum wire loop; *e*, ivory "interrupter" to connect or break the galvanic current by slight pressure of the thumb; *ff*, sockets into which the canulæ can be fixed by screws; *g*, receptacle for connecting wires from battery; on the long screw (*b*) rides the clamp (*h*), between the jaws of which the ends of the platinum wires can be fixed by a screw.—*Lancet*, *Feb.* 8, 1873, *p.* 198.

48.—A NEW HERNIA KNIFE.

By Dr. Alexander Patterson, Surgeon to the Dispensary, Royal Infirmary, Glasgow.

J. M., aged 31 years, admitted 7th October, 1872. Patient has suffered from rupture for some months back. Two days

ago the bowel came down, since which time it could not be re turned. He now labours under strangulated oblique inguinal hernia on the right side. Patient vomits, as he says, "what should go the other way;"—complains of pain radiating from the umbilicus—while the tumour itself is tender, with slight redness over its neck, probably from the application of the taxis outside. M. was put under chloroform, and the operation performed under the carbolic spray. Bowel, to the extent of two feet, was found in the sac, and the stricture was formed by the external ring, a situation at which it is rarely met with in a patient so young—while in old persons and old ruptures it is the common seat of stricture. 8th. Dressed, looking well, only there was œdema of scrotum which was elevated. 11th. Changed to-day. Œdema nearly gone. 13th. Dressed; œdema gone. 18th. Wound quite healed; sutures removed. Dismissed on the 26th October. This was my 34th operation for strangulated hernia, and at it, as in the five cases immediately preceding, I used the knife which you see here; it



differs from Sir Astley Cooper's, simply in the blunt pointed part of the knife having a quarter turn given to it, so that the flattened point passes more readily under the stricture, while its breadth flattens and pushes the gut aside as the cutting part of the blade follows. In femoral hernia especially, the stricture is much more easily cut than with the ordinary knife. I have opened the sac in all the cases in which I have been called upon to operate, as being the safest mode for the patient. Although the stricture is usually external to the sac, yet the neck of the sac itself may form the stricture, adventitious bands may remain inside, and, as length of time is not an absolute criterion as to the state of the contents of the sac, but rather the tightness with which the bowel has been caught, you cannot, with certainty, tell when to open the sac, and when to leave it unopened. I have seen the gut safe after a week's strangulation, and in other cases black in a number of hours, the latter especially in femoral ruptures. Besides, after

all, it is not the operation which kills the patient, but the delay which has taken place before you see the case. The proper way to act when called to a case of strangulated hernia is, I apprehend, to explain the nature of the case to your patient, put him or her under chloroform, try the taxis, and failing reduction, be prepared to operate at once. If you have a blush on the skin over the tumour, omit the taxis, and operate immediately, if the patient's strength will admit. It is, in my humble opinion, great folly to waste precious time in administering purgatives and injections, and waiting for their action. The only cases in which delay is at all admissible, are the large, old herniæ, in men advanced in years, in whom the circulation is slow, the stricture at the external ring, and the strangulation rarely very tight, and consequently where there is less risk of gangrene. In such cases, large injections, thrown up, so as to distend the lower bowel, and be ejected immediately, with the application of ice to the tumour, afford a fair prospect of success.—*Glasgow Medical Journal, Feb.* 1873, *p.* 187.

49.—ON HEMORRHOIDAL AFFECTIONS.

By Christopher Heath, Esq., Surgeon to University College Hospital.

[It cannot be too strongly insisted on that the rectum should be carefully examined in these cases—first with the finger, and then, if necessary, by sight. If the patient is a female, she should lie on her side in the ordinary obstetric position, and the finger may be passed into the vagina as well as into the rectum, as the rectum may often be better examined from the vagina, particularly in cases of stricture.]

If a minute examination is desired, a speculum may be employed. You may use the ordinary glass speculum, with the end cut off obliquely, or one that is not truncated. Perhaps the most convenient and simple one is a metal one, that can always be kept bright. There is a plug inside to facilitate its introduction. Of course, when examining the rectum, the plug must be taken out, and the mucous membrane then falls in. In withdrawing it, if the end is not open you are apt to nip any pile that may exist and to produce a good deal of pain. Therefore an important point is, to pass the finger into the speculum and push out any portion of mucous membrane that may have prolapsed into it. The instrument will then come out easily enough.

There is, however, quite another form of speculum, and one that is perhaps the most convenient of all. It is the bivalve

speculum, being formed of two parts connected by a simple hinge. It has this advantage, that you can fix it open at any point, and then you can readily introduce your finger to examine any part, the speculum being turned round in any direction. Of course, in any examination the great object is to make it with as little pain as possible, and yet with perfect efficiency.

Disease high up the rectum may be seen by means of the endoscope, an instrument not in very common use. I show you one here. The lamp is shut up in the box, and the light from it is reflected by a mirror down the tube, which is introduced into the rectum. Looking through a perforation in the mirror as through the hole in an ophthalmoscope, you are able to see the mucous membrane in the lower end of the tube lit up by the rays of light thrown from the oblique mirror.

One other point with regard to examination of the rectum. It is well to examine it digitally, and also with instruments, but a confident opinion about diseases of the rectum cannot be given unless an enema is administered. This is a most important point. Let the patient get rid of the enema in the ordinary way and strain, so as to bring down anything that will come down, and then you have an opportunity of seeing what is the real state of the lower end of the bowel. Piles, polypi, and other diseases may be overlooked unless this precaution is taken.

With regard to hemorrhoids, commonly known as piles, let me say that there is not necessarily hemorrhage. You may, of course, have bleeding piles, but you may have blind piles, and you may have external or internal piles; but all are classed together as hemorrhoids. The blood-supply of the rectum, I need hardly remind you, is from three sources, the superior, middle, and inferior hemorrhoidal vessels. I have here Mr. Quain's work on the Diseases of the Rectum, the plates in which may serve to remind you of the anatomy of the parts. The connexion of the upper hemorrhoidal vein with the vena porta is important, because it explains the occurrence of piles in persons in whom the portal circulation undergoes any obstruction. In organic disease of the liver, or in any tumour pressing on the portal vein, we are sure to have venous obstruction in the rectum. Hence we get formed a hemorrhoidal tumour, a venous hemorrhoid. Such tumour may be internal or external; more commonly it is internal, and in the form of an elongated vein, such as is well represented here in Mr. Quain's plate. If the veins get large they may protrude from the rectum as a large purple vascular mass, really an internal hemorrhoid becoming external. That is an important point, and to be insisted upon, because the treatment must be for

internal hemorrhoids; and, as we shall see, the treatment of the two disorders differs considerably.

Let us consider for a moment the subject of external hemorrhoids. When a distended hemorrhoidal vein becomes blocked up by a little clot, or by some inflammation around it, the result is that a little purple lump is formed by the side of the rectum. What becomes of such a hemorrhoid if you leave it alone? After a time, the inflammation subsides with or without treatment. It very seldom suppurates. The blood which was effused in the pile becomes absorbed, and, consequently, the skin which was distended by the blood is left loose, and hangs in folds about the anus. If this has been repeated a few times a person who is said to have had several attacks of piles gets a series of loose folds of mucous membrane about the verge of the anus, which folds give rise to a great deal of trouble.

We may dismiss this subject at once, for the treatment of external piles is a tolerably simple matter. You see a little purplish mass outside the anus; all that you have to do is to make an incision into it, and squeeze out the clot. The incision should be made in a direction radiating from the anus. The clot is either in a vein or in a little cyst; it is a disputed point which. Let out the little clot, put a poultice on, and in a day or two the thing subsides, relief being given at once from all the sharp pain which existed before. If you do not thus interfere, you run a risk of suppuration, or of the formation of the troublesome loose folds.

The proper treatment for the loose folds about the anus is to cut them off. You can never do any harm, provided you are careful not to do too much. Pick them up, and snip them off in a direction converging to the anus. Do not do too much, for the reason that if you do a stricture of the anus may be the result. Every now and then one sees a patient who has been submitted to this heroic treatment, and who has got, as a consequence, stricture of the anus—a most painful complaint, which is practically incurable. So much for the subject of external piles.

Internal piles give rise to a sense of weight and discomfort if they are simply blind piles, but if they are bleeding piles, in addition there is loss of blood. The hemorrhage may be simply venous, and if so it is of no great moment. It is no doubt due to some pressure on the portal vein, and it may be salutary in one sense—it may relieve the engorgement of the internal organs, and if slight it is perhaps better not checked. If you find, however, that the patient is losing arterial blood it is another matter. It is a mistake very commonly made to suppose that the hemorrhage from piles is necessarily venous; it

is by no means so. Sometimes the patient goes to the closet and finds a considerable quantity of arterial blood is evacuated, that it comes in gushes from the anus. Under these circumstances the patient becomes much reduced, loses blood in a way which the system cannot support, and may actually die from loss of blood from bleeding piles, though fortunately now-a-days this is rare. Loss of blood in excessive quantity is much more apt to occur and to be concealed among females than among males, both because the patient does not like to complain of it, and because the doctor sometimes is not careful to inquire about it. The patient is seen to be anæmic, and the anæmia is treated without any investigation being made into the cause of the affection, whether from bleeding piles or otherwise. Always, therefore, in such a case, inquire whether there be loss of blood from the rectum. Of course this may occur as vicarious menstruation, cases being met with now and then in which a discharge from the rectum regularly recurs, month after month. With such loss it would probably not be advisable to interfere until the normal discharge is re-established.

Bleeding may occur from within the bowel, even though nothing ever comes down. The patient simply looses blood, and can tell you nothing more about it. Passing the finger into the bowel, it may often be found that there is a peculiar velvety feeling about one side, and on withdrawing the finger it is seen to be stained with blood. On introducing a speculum, and examining the spot, it will be found that there is a vascular-looking portion of the mucous membrane, much more like red velvet than anything else, from which the blood is passing. If such is the condition it can readily be cured. It is in these cases that nitric acid does such good. Apply the acid upon a stick through the speculum, touching the surface tolerably freely, care being taken to prevent the acid getting to other parts of the mucous membrane. One or two applications will often cure the case altogether. Usually, in addition to the loss of blood, with the straining there comes down a great mass of piles, originally internal, now external, all being thrust through the sphincter. From certain portions of the mass, usually the upper parts, which have this peculiar red appearance, blood exudes. These are cases in which more radical treatment must be adopted. You may, if you like, touch them with nitric acid, and a few years ago it was recommended as a panacea for all rectal disease. No doubt by it the hemorrhage may be controlled for the time being; but you will not cure the piles, and the probability is that in a very few months the patient will again suffer from them, and perhaps also from the bleeding. Yet I occasionally use nitric acid for one single pile, especially in women, on the perineal side of the rectum,

when the small vascular growth can be almost destroyed with one application of nitric acid; but I do not employ it for anything like a large spongy mass from which blood exudes, the delicate skin of the anus being everted and swollen and protruded by the side of it. I am particular about calling attention to this last, because it is very important with regard to treatment, since it must not be interfered with too freely, or a stricture is likely to be produced.

Given a case of that severity, what mode of treatment is to be recommended for it? The older surgeons used to cut off these piles. Dupuytren was exceedingly fond of doing this, and he cut them off with some success, but had many fatal cases simply from hemorrhage. You will find in his "Leçons Orales" that he had lost several patients, and that in other cases he had great difficulty in stopping the bleeding. I need hardly say that such a state of things is not desirable, and would be sufficient to warrant one in finding some other method. Brodie was the first to use the ligature. He says in his Lectures that he happened to come across a lecture of Mr. Cline's, in which he decried the ligature, and said that only timid surgeons would use it, and that there was no harm in cutting the piles off. So Sir Benjamin Brodie adopted for a short time the practice of cutting them off; but he found that he lost a patient from hemorrhage. Sir Astley Cooper did the same, and lost one or two patients from bleeding into the rectum. Now-a-days I think no surgeon would think of cutting away internal hemorrhoids without taking the most effectual means to arrest the hemorrhage. In the great majority of cases the ligature is the most effectual means. Holding up the pile with forceps, you may put the needle through the base of one pile and tie it in two parts, and then treat the other masses in the same way. After a few days, when the parts have healed, there will be a complete relief to the ailment. But it is a very painful mode. You cannot help including some of the delicate skin of the anus, which is so well drawn in the figure in Mr. Curling's book. The pressure of the ligature in ulcerating through that gives rise to great distress; therefore it was that Mr. Salmon, who had a large experience in diseases of the rectum, proposed his plan. The hemorrhoidal vessels enter the pile at the upper part, and therefore there is no danger in cutting at the lower part, where skin and mucous membrane join, so long as you take care to leave at the upper part the vessels untouched. Accordingly, instead of simply tying the pile, he cut between the mucous membrane and the rectum with a pair of scissors. Thus he isolated the pile from the delicate skin, and applied the ligature to the neck of the pile. That is the operation I ordinarily perform when I apply the ligature. The instruments

required are simple. First, to get the pile down, the patient must have an enema, and strain. Then you grasp it with a pair of pile forceps, or, if you prefer it, with Salmon's hook, which answers exceedingly well, slipping the instrument into the anus, getting hold of the pile, and drawing it down. Taking a pair of curved scissors, you snip at the line where the mucous membrane and the skin join. Having dissected up the pile in that way, then carry the ligature round the base of the pile, and tie the essential part of the pile in that way. Having done that, and thus secured the vessels, you may safely cut off the part you have isolated, within a reasonable distance of the ligature. That is the advantage of this modern operation: you can cut off the piles and get rid of them, instead of allowing them to slough away, much to the distress of the patient. Probably two or three piles will need separate treatment thus. The ligatures will probably come away at the end of a week, according to the thickness you have tied. In a few days more the patients are perfectly well and comfortable, and relieved. It is a satisfactory point to remember that if you operate on a couple of piles in the rectum in that way, although you have not destroyed the whole of the disease, the influence of the ligature and of the ulcerating and healing process is such that the patient is practically cured of his disease. Let me remind you that the operation is not finished if you have any loose folds about the margin, to which I have already referred. They should always be chipped off, though not to the extent of producing stricture of the anus.

Another method of treating piles which has been much cried up in modern times is the method with the clamp. The original clamp was an invention to be used in connection with nitric acid. The late Mr. Houston, of Dublin, Mr. H. Lee, and others, have been in the habit of clamping the pile, cutting it off, and applying nitric acid. That was a tolerably effectual method, but it had its drawbacks. Mr. Henry Smith improved the clamp, and made it a useful instrument in certain cases. Its object is to take up the pile or mucous membrane, and, with a screw in the handle, to compress it. You then cut off the pile, and sear the cut surface with a small cautery, so as to stop all hemorrhage. It answers well for slight cases, where you have loose mucous membrane, and not great masses of piles, and especially in those cases in which you have an opportunity afterwards of watching for hemorrhage. I never operate in this way on cases which are bad or are at a distance, because there may be hemorrhage afterwards. It does not often occur, but it does sometimes. If a ligature has been left on you know that hemorrhage cannot occur, and that you may trust the patient at a distance from the surgeon. Another little

drawback in the clamp is, that the greatest power is exerted at the hinge, which is at the anus. The critical part, where the vessels are, is apt to slip out of the grasp of the blades. To obviate this difficulty, Mr. Gowlland, who has had great experience in diseases of the rectum, invented a clamp which acts on a similar principle, but instead of applying it from below upwards, as Mr. Smith's clamp would be applied, it is intended to be applied from above downwards. The hinge against which the pressure is being exerted is at the upper part, where the vessels exist. My colleague Mr Scott has also contrived a clamp of the same kind, in which the screw is retained instead of the spring catch of Mr. Gowlland's instrument. No doubt these are safer clamps, but are more difficult to apply, and therefore, for slight cases, I generally use Mr. Smith's clamp, while for more severe cases I prefer to use the ligature.

The after-treatment is simple. Give a suppository at the time of the operation, or give an injection of opium. Keep the patient quiet, and keep the bowels confined for a few days. On the third day give a little castor oil or some mild purgative, and let a bread-and-milk poultice be applied to the anus for a few hours after the first action of the bowels, which is always painful. Afterwards keep the bowels regular: and in a few days the patient will be well of his malady. If you have had to take away some pieces of loose skin, a few days longer will be required, and the application of the dilute nitrate-of-mercury ointment will be beneficial. You may safely promise the patient relief from all his troubles in ten days or a fortnight. I have had many cases here which have done exceedingly well with both methods of treatment.—*Lancet*, *Jan.* 18, 1873, *p.* 82.

50.—ON POLYPUS OF THE RECTUM, PROLAPSUS, FISSURE, AND FISTULA IN ANO.

By Christopher Heath, Esq., Surgeon to University College Hospital.

Polypus.—Patients not unfrequently complain of piles or prolapse of the rectum when really affected with polypus. In children it is not uncommon, and is a cause of bleeding from the bowel. Piles are rather uncommon in children; and if a child is brought to you with bleeding from the bowel, you are very likely to find in the rectum a little fibro-cellular polypus. I have a drawing here of one with a long pedicle. It is a simple matter when once made out, and may be removed with safety to the patient. If small, in children, it may be broken

off with the finger and no hemorrhage result; but if large, and in an adult, it is safer to ligature the pedicle, and there is no difficulty in the operation. Draw the polypus down and apply the ligature, cut off the pedicle near the polypus, and you will have no further trouble about it. The patient in a few days will be completely relieved of his distress. I have operated myself in that way repeatedly, and have never had any trouble.

Prolapsus Ani.—Another disease which you often find confounded with ordinary hemorrhoidal disease is prolapse of the rectum. Here is a drawing showing a portion of mucous membrane largely prolapsed. I may say that we can draw a distinction between prolapse and procidentia just as we can with regard to the uterus. By prolapsus we ordinarily mean simply the mucous membrane prolapsing. It may be hemorrhoidal or not; in many cases it is so. By procidentia we mean the whole rectum coming down: all the coats, the muscular and it may be the peritoneal coat also. In such cases it would not do to cut off any part of the bowel. Yet this has, I am sorry to say, been done once or twice, and the peritoneal cavity has been opened.

I will not now consider those extreme cases. I will confine myself to-night to the ordinary form of prolapse which occurs in children and elderly people. In children it is commonly the result of straining; in elderly women it is generally the result of weakening of the perineal structures, when, on some exertion, the bowel descends. Obviously, such cases should be distinguished from the more severe cases of prolapse of the entire bowel. Passing the finger over the prolapse, we find smooth mucous membrane turned inside out, which can usually be returned by slight pressure. In children it is better to give chloroform; in other cases it is easily reduced without.

Treatment for the tendency to prolapse may be either palliative or curative. Palliative treatment consists of styptic injections into the rectum; or you can, if you choose, let the patient wear some kind of support—an ordinary bandage, or, what I think is very objectionable, one of the anal supports, a pessary thrust into the anus, and supported by a kind of sling or truss. A much better plan is to try and produce a radical cure, which may be done in two or three ways. In the first place, you may use nitric acid, applying it over the prolapsed mucous membrane. There is one danger against which you must be warned, and that is, the danger of producing a stricture. I have known that occur. What I prefer myself is, to use nitric acid in stripes down the prolapsed rectum, rather than to smear the whole surface. If you adopt the latter plan,

four or five stripes are sufficient, and thus all risk of producing too much contraction is avoided. Another mode of producing a cure is to narrow the anus. In these cases we find the anus has become distended by the habitual enlargement; and if you remove some of the skin about the margin of the anus by scissors and forceps, in the way I have already mentioned when speaking of hemorrhoids, the parts contract in healing, and a support is given to the lower end of the rectum which practically cures the patient of his disease.

Fissure of the Rectum.—We will pass now to another subject,—namely, fissure. I may say at once that we see a great number of cases of fissure at this hospital, because it is more common among women than among men. Generally you find that the patient complains of great pain in the act of defecation. A woman came here this afternoon and complained that she had piles, and suffered great pain during defecation. I was pretty sure, however, she had not piles, because if she had piles, the pain would have been continuous. When examined there was a well-marked fissure at the place where it so often exists—namely at the posterior surface of the rectum. It is much more common at the posterior than at the anterior part. In these cases examination shows us at once the little ulcerated edges of a split in the mucous membrane. The passage of fæces in a case of fissure causes excruciating pain, and hence more or less spasmodic contraction, due no doubt, to the irritation of the ulcer by the fæces.

What is the cause of the fissure? It may be simply mechanical. The patient has had constipated bowels, and in passing the motion the mucous membrane was a little torn. A certain amount of spasm of the anus was the result, and when the next motion passed, the irritation was again repeated. The anus was never quiet, the fissure never allowed time to heal, and consequently, there the fissure is. Or a fissure may result from some slight tear of the part during parturition. Or it may have arisen in another way: an ulcer in the lower part of the rectum may extend downwards through the sphincter, which keeps up constant irritation, as in the former case.

You may palliate, and sometimes cure, this affection by the use of simple remedies. The best plan, I think, is to use equal parts of belladonna and mercurial ointment, introduced by the finger of the patient twice daily, care being taken to keep the bowels from becoming costive. In this way many slight cases may be cured. If it is a bad case, however, it is better to adopt some more radical treatment. One method is the forcible dilatation of the anus with the two thumbs or fingers, as originally recommended by the French surgeon, Recamier.

You thus tear open the fissure and also a few fibres of the sphincter, and to some extent paralyse the sphincter, and then, traction upon it ceasing, the ulcer soon heals. The dilatation may be followed by the application of some simple ointment, and in many cases a perfect cure results. Of course it is painful, but it has this advantage, that it does not lay the patient up. At the same time, I may say that you must not expect too much, and you must be careful not to do too much. One patient, I remember, in whom too much was done, had ever afterwards some little incontinence of fæces. So it is important not to be too vigorous.

A more surgical proceeding is, no doubt, to divide the fissure with a straight bistoury. Pass the finger within the anus, get the finger close against the ulcer and against the fissure, and then introducing the knife flat upon the finger, turn the edge against the fissure, and draw it gently out. In that way you cut the whole length of the ulcer. It is not necessary to cut deeply; a few fibres of the sphincter alone need to be divided. A few days' rest in bed and syringing out of the rectum, every trouble may be relieved, and the patient speedily be well. That is a much simpler measure than the plan originally suggested by the French surgeon, Boyer. He introduced a bistoury into the anus, and cut boldly through the rectum and sphincter into the ischio-rectal fossa. Such a cut took long to heal, and did the patient considerable damage. To the late Mr. Copeland and to Mr. Quain is due the credit of showing that all the good effect of the operation could be gained by the slight cut I have already described, and in the great majority of cases this is sufficient to cure the patient of his disease.

A little point which should be borne in mind is, that in the upper part of the fissure we now and then find a little protruding polypoid growth of simple granulation tissue springing up from the bottom of the ulcer. If that is left, a risk is run that the patient will not be cured. The growth may be clipped away with scissors, or scratched away with a knife, without fear of hemorrhage.

Fistula in Ano.—I now pass on to speak of abscess in connection with the rectum, and also of the result of abscess—namely, fistula. Of course, you may have abscesses of various kinds, superficial or deep. A superficial abscess may be simply a suppurating pile. The deeper form, that which ends in fistula in ano is an abscess by the side of the bowel. It is connected usually, or at least in most cases, with some perforation of the bowel itself—perforation either from a foreign body, as a fish bone, or more frequently due to a small ulceration just above the sphincter, through which some portion of fæcal

matter escapes. The fæcal matter, of course, acts as a foreign body in the loose cellular tissue of the ischio-rectal fossa, inflammation occurs, and the result is an abscess pointing externally by the side of the anus.

You will find that the pus which is discharged in these two classes of cases differs very much. If it is a simple abscess—an abscess arising from an injury, exposure to cold, a damp seat, or a suppurating pile—the pus is simple, like that of an ordinary healthy abscess. If, however, it is an abscess derived originally from the bowel, either by perforation of a foreign body or the perforation of an ulcer, you have that excessively fetid pus which is generally put down as characteristic of all abscesses by the side of the bowel.

The symptoms, of course, are those of an ordinary abscess—swelling, throbbing pain, gradual reddening of the skin, a tendency to pit. The sooner the abscess is opened the better, because, if it has not already perforated the bowel, if it be one of those abscesses which arise in the ischio-rectal fossa, it is very important to prevent it from perforating the bowel, which it is very apt to do if allowed to run its ordinary course. Therefore a free vent for the matter is of the greatest importance. In making the incision the best way is to use a good-sized bistoury, plunge it boldly into the abscess close to the anus, and make a cut radiating from the anus, so as not to injure the bowel in any way, and yet to make a good free vent for the matter. The after-treatment is that of an ordinary abscess. There is no question that an abscess of that kind, even if close upon the bowel, may be laid open without perforating the bowel. Unfortunately, in many cases, it is found that such perforation has already taken place, or that, if not already communicating, in process of time the abscess does perforate the bowel, and then we have a fistula in ano produced.

Fistulæ in ano have been described as of various kinds. In the first place there are two great divisions, complete and incomplete. The complete are those in which there is an external opening to the remains of the abscess, and an internal opening from that again into the bowel, usually just above the internal sphincter. The incomplete fistulæ are those in which there is an external or an internal opening only, and those fistulæ are named either blind external or blind internal fistulæ, according to the position of the opening. There is here a little contradiction in terms which it is well to be clear about. A blind external fistula is one which does not open at the inner end. On the other hand, a blind internal fistula is one that has an opening into the bowel, but which does not open externally. A blind internal fistula is do doubt very rare. When

I say very rare, I mean compared with a complete fistula, or with an external blind fistula. But it is more common than many people suppose, and you will find, every now and then, that by examining the lower portion of the bowel you can feel a little opening, and by bending a probe you can hook it into the opening of the blind internal fistula, and by pushing the end down you can make it protrude the skin by the side of the anus, and show that there is an opening or communication between the bowel above and the abscess below. I mention this particularly because it is a form of fistula which is very apt to be overlooked. I may say at once, in order to dismiss the subject, that the proper treatment is to convert it into a complete fistula. Cut upon the end of the probe, and if it does not heal up at once, treat it as you would a complete fistula—lay it open into the bowel.

With regard to external fistula, the ordinary form, There has been a variety of views concerning the question of the internal opening. Sir Benjamin Brodie laid down the rule that there always was an internal opening, but that is not quite true. In the great majority of cases, no doubt, there is an internal opening, although you may not be able to find it in all instances. We meet occasionally, however, with cases in which we can prove to demonstration by dissection that there is none.

There is a difficulty with regard to the internal opening which I may illustrate with a rough diagram. Take an imaginary section of the bowel. Here we have the track of the fistula passing up for some distance with the internal opening at the top, above the internal sphincter. The abscess has perhaps burrowed further, and opened up a track alongside the bowel; and then, in the examination of the fistula, the probe is passed unconsciously beyond the internal opening, and often for some distance beneath the mucous membrane of the bowel, as is felt by the finger introduced into the rectum. Of course it does sometimes happen that another opening has formed there; for unquestionably there are cases in which you have two internal openings. It is then very important, most important, that in dividing the fistula you should not merely lay it open as far as the upper opening, but should also divide the original *bona-fide* internal opening, which is generally to be found close above the internal sphincter. If you get the probe in here you at once feel it; if not, take great care in drawing the knife down that you try to hit it. It is no doubt the explanation of many cases of unsuccessful operation that the internal opening has been overlooked.

The operation itself is simple. The old surgical operation was a brutal proceeding. It consisted in cutting out the fistula,

and even nowadays, I am told, patients may be seen whose fistulæ have been cut out. It was a perfectly unnecessary proceeding, and of course great damage was done; the sphincter was cut away considerably, and the patient was left in a much more wretched state than before. The great thing is to lay open the fistula into the bowel. This you can do by passing a probe-pointed bistoury up the fistula and putting the finger into the rectum; then, with the finger in contact with the end of the bistoury, draw it down. Perhaps a more simple mode is to use a probe-pointed director, which you can guide steadily up through the fistula to the finger which is in the rectum, and, having met the finger with the probe point of this, you then bend down the point, and with a little manipulation, the parts being lax in the living body, you are able to push the director through the opening, bending it a little so as to bring the extremity out at the anus. All that is then necessary is to run a sharp-pointed bistoury along the director, and to lay the fistula completely open. Either way answers very well: it is a matter of taste which you choose.

Having laid open the main fistula, it is of great importance to examine most carefully in a good light for supplemental fistulæ; because these are too often overlooked, and it is found that the patient on whom the operation has been performed does not get well, and leaves the hospital uncured, and finally has another operation performed before a permanent cure is effected. The explanation is that there is another fistulous tract at one side. On cutting the fistula and laying it open into the bowel, perhaps half way along it you find another opening leading out in another direction; and if that is overlooked, the result is that you will not cure the patient. Examine very carefully then in each direction, and lay all supplemental fistulæ freely open. I do not advocate more cutting than you can help; but you must lay all open to do good. The only caution with regard to the female is, that if you cut very close upon the junction of the sphincter ani and sphincter vaginæ you are very apt to get some incontinence of fæces afterwards. You cannot always help it. The sphincter is slow to return to its normal condition, and it may take many months to get over it.

Another point of great importance is to treat the thickened loose corners of skin which are badly nourished and prevent the part from healing. One of the greatest improvements, I take it, of the modern treatment of fistula is the cutting off of these corners of loose skin. It is a practice followed first in St. Mark's Hospital in the City-road, and I have since adopted it myself with great advantage. It is no return to the old operation of cutting out the fistula. You simply take up the

loose undermined corners of skin, and cut them off with a sharp pair of scissors. Thus you save time. The parts beneath begin to granulate up at once, contract, and heal rapidly, and so you may often cure a patient in a few weeks who, if the corners had been left, would not have been well for a month or two. There is of course a little hemorrhage, but the parts have become indurated, and the vessels at the lower part do not bleed very freely, and they are easily controlled with a little plugging. In the part of the fistula represented here [diagram referred to], running up by the side of the bowel, there is, no doubt, danger of hemorrhage. I have seen sharp hemorrhage from the division of such a fistula high up, and perhaps the best way to avoid it is not to use a knife in that upper part of the bowel, but a pair of scissors, as recommended by Mr. Allingham. Pass a director along the mucous membrane, and with a pair of scissors lay it open through a speculum, slitting it up. It is well afterwards to plug the opening carefully with cotton wool, so that there should be no hemorrhage. After some days' rest it will come away gradually, and will have prevented hemorrhage and all trouble. The best after-dressing of a fistula is to leave it alone. Daily stuffing it with oiled lint is a labour most painful to the patient and troublesome to the surgeon, and fulfils no object whatever. Do not allow the edges of a divided fistula to unite at once, but after twenty-four hours there is not much danger of that. Keep a little oiled lint or cotton wool within the edges for twenty-four hours, and leave the parts alone afterwards. Keep the bowels locked for a day or two, and then give an enema and clear them out. Afterwards keep the bowels regular, and every now and then have a little red lotion injected into the fistula.

There are other modes of treatment of fistula besides the knife which deserve mention. You may divide a fistula with the ligature if you choose. The high fistula is that which is best treated in that manner. A wire ligature may be used, or the special instrument devised by Mr Luke some years ago. The treatment by the ligature has been rather quacked, that is the misfortune. "Treatment without cutting" means treatment by the ligature. It is a much longer proceeding, and, unless for some special reason, I should always have recourse to the knife.

There is no question about operating on patients subject to phthisis. No doubt there is a tendency among phthisical persons to suffer from fistula of the anus; and the question commonly arises, Ought they to be operated upon? It does not do to lay down the law too broadly. If it is a case of early phthisis, and the fistula is a source of annoyance to the patient,

I should decidedly operate. If, on the contrary, the lungs are riddled with abscesses, and the patient is going into the last stage, it would be madness to think of such a thing. If you did, the sinus would not heal up, and the operation would simply add to the patient's discomfort. In early cases it is different. The fear of throwing the disease upon the lungs has almost died out, and we no longer hesitate to relieve a tolerably healthy patient from a troublesome and depressing malady. A young man decidedly phthisical, on whom I operated two years ago, has just returned from the Cape with the fistula perfectly sound.

Pruritus Ani.—We come next to an affection which is very troublesome both to the patient and to the surgeon—viz., pruritus: troublesome itching about the anus. It may arise from various causes. No doubt indigestion is a frequent cause, the patient having eaten food that disagrees with him. Or it may arise from local causes; and if this is the case, so much the better for the surgeon, because he can probably get rid of them. Ascarides—the ordinary thread worms—will sometimes set up intolerable itching about the anus; and it is a mistake to suppose that you do not meet with them in the adult. The treatment is simple: get rid of them by some injection of quassia or common salt, and you cure the patient. But it may also arise from other causes which may be got rid of, as for instance, pediculi pubis, familiarly known as "crabs," which creep to the anus, and keep up the irritation in the same way as do the ascarides. They are readily got rid of with mercurial lotion.

The cases in which there is no local cause and yet intolerable itching, are much more difficult to treat. The most important things are to attend to the general health and to use sedative applications to the anus. The greatest cleanliness must of course be insisted on. Piles are sometimes a cause of pruritus. You may find the anus and the parts about irritated by constant scratching. As far as I have seen, they present no marked peculiarity. I notice, however, that Mr. Allingham, in his recently published book, calls attention to the absence of pigment as being a pathognomonic sign of pruritus ani. It It may be so, but I have not myself remarked it. He says that if he finds patches of white skin slightly discoloured in the neighbourhood, he is perfectly sure that he has a case of pruritus ani to treat. Unfortunately the universal experience is that pruritus is most difficult to treat, and you may try every variety of sedative lotion or ointment without giving your patient much relief. I think I have seen benefit from the use of a lotion containing borax and vinum colchici, of each one

ounce, in a pint of decoction of poppies, but I should be sorry to say that this was infallible.—*Lancet, Feb.* 22, 1873, *p.* 262.

51.—TREATMENT OF PRURITUS ANI.

[A correspondent, W. B., of Bradford, writing to the Lancet, says:]

At the end of Mr. Heath's lecture on Diseases of the Rectum [see preceding article], he says that "the universal experience is that the pruritus (ani) is most difficult to treat, and you may give every variety of sedative lotion or ointment without giving your patient much relief." I have found so much satisfaction in prescribing for pruritus a weak solution of carbolic acid (1 in 96 or 100) that I hasten to suggest this as a most valuable addition to our stock of remedies for this troublesome complaint. There is no application I know of so instantly beneficial in relieving the itching soreness which affects some persons after an evacuation.

[Dr. JAMES THOMPSON, of Leamington, writes to the Lancet, as follows:]

I have prescribed with much benefit carbolic acid, as your correspondent has done; but the mode of appliance was different, and in my cases much more effectual than the lotion. I direct the sufferer to place a small plug of marine lint in the anus every night, so that a small portion might be caught by the external sphincter to keep it in position; the remaining part forms a pad outside, keeping the parts from contact. In every case much benefit was the result. I commend this ready means of applying carbolic acid to surgeons in similar cases.—*Lancet, March* 8 *and* 15, 1873, *pp.* 364, 399.

ORGANS OF URINE AND GENERATION.

52.—ON THE INFLUENCE OF RENAL DISEASE ON THE CHOICE OF OPERATION FOR STONE IN THE BLADDER.

By Sir HENRY THOMPSON, Surgeon to H.M. the King of the Belgians, Professor of Clinical Surgery in University College Hospital.

When stone in the bladder coexists with any disease of the kidney, how does this influence the decision in regard to operative proceedings for the former?

1. I must first define what is to be understood here by the term "disease of the kidney." It is a comprehensive one, and is apt to be employed somewhat loosely. It embraces, of course, all the morbid affections to which the kidney is liable. These I shall endeavour to classify in a broad and general way; and in doing so will put aside, as obviously foreign to the subject in relation to operative measures, the malignant diseases of the organ.

(*a*) Those chronic changes in the kidney structure associated with constitutional cachexia, of which they may be more a local expression than a cause, and which are comprehended under the term "Bright's disease," form an important proportion of the maladies in question. In the dead-house you know that we meet with kidneys differing very much in appearance, size, and structural characters, all yet furnishing examples of different kinds of Bright's kidney, or, in some cases, of different stages of the same kind of disease. Most are included under the distinct types of "the granular contracted kidney," like that of our patient, and "the large, smooth, white kidney." Not to overlook a much more rare condition. I just name the "lardaceous" or so-called "amyloid" degeneration. Now the symptoms which denote Bright's disease are, for the most part, sufficiently clear and distinct during life, as you know; and the amount or stage of disease is, within certain limits, fairly calculable after some knowledge of the patient.

(*b*) Another kind of change which is wholly distinct from the foregoing occurs in kidneys which are either frequently or for a considerable time the seat of calculus.

The presence of minute foreign bodies, for the most part aggregations of uric-acid crystals, in the uriniferous tubes, at their orifices and around them, in the calices, is a cause of injury to the structure affected in a degree corresponding to the duration and the magnitude of the deposited matter. Any degree of injury, from a circumscribed and temporary inflammation of the lining membrane of the pelvis caused by a large quantity of rapidly formed crystals, up to almost entire destruction of the organ from the presence of a large renal calculus, may be observed. Happily, the latter condition is rare. On the other hand, the former is very common. I doubt whether any man passes much concrete uric acid for a few months without some little damage to the kidney. Certainly, during the process blood is almost always to be found in the urine by the microscope; and it must be inferred that when the habit of passing periodically uric-acid calculi has existed for some years, a certain degree of permanent deterioration has been suffered by the kidneys. There are no other special signs

of this condition. The patient's general health is often very good. There is no cachexia as in the class of diseases (morbus Brightii) just referred to. On the contrary, the patient is often hale and hearty in appearance. The characters of the urine are good; quantity abundant; specific gravity full average; no albumen, but urates often in excess, and blood-discs are present, insufficient to affect the naked-eye tint of the urine. Pain about the renal and sacral regions and the hips often complained of. But I have frequently remarked to you that such patients often exhibit considerable febrile phenomena on instrumental interference, and that, although they look so well, more than ordinary caution is necessary in dealing with their calculi.

(*c*) I name, without further allusion to it here, saccharine diabetes, which cannot be passed over while considering renal diseases. To save returning to the subject, let me say that there is no question that for this and the preceding class, in which patients with vesical calculus are usually elderly, lithotrity is certainly preferable to lithotomy, unless the stone is large. The exercise of caution on the part of the operator to employ instruments as little and as gently as possible is essential. I have operated on two patients with success who were the subjects of marked saccharine diabetes, one of them within the last month; both were very sensitive to mechanical interference. A large number of elderly people with uric-acid calculus possess renal organs which have been subject more or less to prolonged irritation produced by the formation of small renal calculi; and when the degree is considerable, all operations on the bladder are more hazardous in consequence.

(*d*) The last class of renal changes which I have to consider are those resulting from diseases which habitually obstruct the outflow of urine. This affection also is not uncommon, and has an intimate relation to our subject.

Many years ago I described the process by which these changes occur. The principal conditions which originate them are, stricture of the urethra, enlargement of the prostate, large vesical calculus, and, less commonly, atony of the bladder. The order of enumeration is also the order of numerical frequency as a cause. Stricture always constitutes an obstruction to the outflow of urine commensurate with the degree of the narrowing. Considerable prostatic enlargement is a cause also, but notably less powerful than the preceding. Vesical calculus sometimes acts in the same way, but by no means as a rule; on the contrary, it is an exceptional circumstance when it does so, depending on certain conditions which vary with the individual, such as the habitual position it occupies in the bladder, its size, its liability to roll to the neck, &c.

This, however, is certain, that in cases of long-standing calculus, an autopsy will sometimes show only slight signs of renal changes produced by obstruction, while in another case those changes will be remarkable for their extent and degree. In no instance, be it remarked, do such changes occur apart from obstructed micturition in some form, and always of long standing.

The changes I refer to are dilatation of all the urinary passages behind the point of obstruction. Thus, in stricture of the urethra, we may observe dilatation of the urethra itself and its glands, protrusion of the mucous lining of the bladder through the interlacing fibres of the muscular coat, producing sacculi, dilatation of the ureters, of the pelvis of the kidney, of the proper renal structure, and thinning by pressure of the renal substance itself; so that the organ has the appearance of a series of cysts, which formerly was really supposed to be its pathological condition. I may refer to a work published in 1854, where the details were given by me with considerable minuteness of the changes which occur through the influence of fluid pressure. Let us consider for a moment the mechanical process by which this remarkable series of changes is effected. You know that hydraulic pressure is equal in every direction. Thus, if I make pressure on a flexible bag filled with fluid, that pressure is exerted equally at every point of the periphery; and if tubes are inserted, say in a vertical position at opposite sides, the fluid will rise and issue with equal force from each. Now, what happens in the flexible bag which constitutes the human bladder when obstruction exists in the form of stricture, enlarged prostate, or calculus? More force than natural is of course exerted to accomplish the act of micturition; the patient "strains," as he says, to pass his water, and sometimes, if the obstruction is considerable, the force exerted is very great. You see at once that this tells not only in the anterior direction upon the obstruction itself, but also on the ureters which enter the bladder from the kidney behind. Let us say that the ordinary pressure required to pass water in the healthy organs is one pound to the square inch (one number being, for the sake of illustration, as good as another), when obstruction is present the pressure may certainly be increased two, three, five times, or more. Further, the act of relieving the bladder, instead of occurring only five times in the twenty-four hours, and being speedily completed, may recur ten or twenty times, and the duration of the act may be greatly increased also. It is not necessary to explain to you how this state of things must act, and how that after a time (for the mouths of the ureters, not being so patent as the inner orifice of the urethra, do not easily yield to pressure) every act of straining tells on

the passages, and dilatation advances by degrees until at last even the kidney suffers from the continued pressure and from the inflammatory process which necessarily accompanies it; for the ureters and pelves of the kidney may become supplementary reservoirs to the bladder, and are sometimes found filled with decomposed and ammoniacal urine. Long before this stage arrives inflammatory action invades these parts, a condition recognised, as you know, as pyelitis [diagram of dilated organs made]. By some this condition has been called "surgical kidney," a phrase which others have applied to denote the acute suppurative nephritis which sometimes closes the scene for a patient who has long had renal disease. I was glad to find Dr. Dickinson proposing at the Medico-Chirurgical Society to abolish so unphilosophical a term. It is one I never use and have a strong objection to. Why "surgical" kidney indeed? Certainly in one sense only—namely, that it is for want of surgical aid that the organs have come to the state in which they are. If that aid were rendered early in the history of the case, whether it be stricture or stone, no such condition would ever arise. Never was the proverb truer that "a stitch in time saves nine"—a surgical stitch, you understand. The pathological condition thus attained might well be termed "mechanical dilatation" of the ureter and kidney, as being mainly, although not entirely perhaps, produced by the physical process described.

Let me now inquire what are the symptoms which it produces during life? I know of none which are distinct and significant. I made this, I had almost said, humiliating admission, nearly three years ago at the Royal Medical and Chirurgical Society, laying much stress on the fact for the express purpose of inviting attention to it. I have long sought for some sign that should indicate the presence of extensive pyelitis and dilatation, but in vain. Such a patient presents no sign of change in the urine itself. It is of full specific gravity, abundant in quantity, without albumen, except that which the presence of pus and blood accounts for, and such pus and blood are commonly found as vesical products formed by irritation from the calculus in cases where no renal disease exists. Whenever you have stone of more than small size you may have such products, and we are bound to expect them if the patient has any symptoms of cystitis, and some cystitis is always present in these cases of dilatation. Again, there is nothing which we can identify as disintegrated portions of renal tissue—no casts of tubes, nothing but pus and blood-discs—nothing, in short, distinctive. Then at no stage of the disease is there any dropsical effusion, no habitual dryness of the skin, not necessarily any marked feverish state, constant or

intermitting. Nor is there any diminution of weight; on the contrary, the patient may have gradually acquired fat. But he is always, if the condition is advanced, in feeble health, is worn, and easily exhausted—signs which impress you with nothing so much as his obvious inability to bear any severe test of his physical powers, from all of which, however, nothing absolutely diagnostic can be inferred.

But it has been said, and with some plausibility, if the kidney is much damaged by disease, the urine will certainly show a deficiency of urea. Practically that is not so. Practically, with much pyelitis and dilatation, urea is sufficiently elminated. Two half-kidneys, to speak roughly, will probably do the necessary elimination for the system in circumstances of quiescence, just as two half-lungs may suffice for a patient in very favourable circumstances; and failure to excrete urea is only manifest when the action of those two moieties of kidney is suddenly interfered with, by disturbance from external cold, &c., or by the inflammation propagated by means of an operation on the urethra or bladder. Practically, again, if I examine the urine of a patient in order to determine the amount of urea, and find it manifestly insufficient, is it not the fact that my patient must at that moment be to some extent in a condition of uræmic poisoning, and that he will certainly show some clinical sign thereof? Is not the fact that no such sign is present the only real proof that urea is sufficiently eliminated? Once the urinary constituents begin to be retained in the blood, the moment is at hand when symptoms of poisoning will appear. The chemical test alone must not be relied on in practice. When a patient passes abundance of urine of specific gravity 1018 to 1025, without casts, with no albumen except that which is due to the blood and pus found in the secretion, we have no ground for believing that any advanced organic renal disease exists, unless we obtain evidence of its presence from other sources.

Now, I never operate for stone without first ascertaining whether the condition of the urine is that above described; so that if I undertake an operation for a patient manifestly the subject of renal disease, it is in full view of that fact, and because it may be absolutely necessary that surgical relief must be attempted at all hazards. Of this I have to speak by-and-by. No one would be more ready than myself to obtain further aid from chemical tests. I only fear that none are known which can aid us to demonstrate the presence of the mechanical dilatation to which I have referred.

Again, it has been said, Can you not by palpation or percussion demonstrate the existence of this disease? I answer for myself distinctly "No." A foreign authority demanding the

utmost respect has recently affirmed that it is possible. With great deference, and after giving much special attention to the matter for some years, I emphasise my dissent on this point. I have long recognised this condition as one of the great stumbling blocks, perhaps the greatest now existing, in our way to diminish the mortality after operations for vesical calculi of large size. Had I any means of certainly ascertaining that a patient *with such a stone* had ureters and kidneys largely dilated, I would advise him not to submit to any operation, and I would do all I could to prolong his life and make it tolerable—a condition within certain narrow limits to be attained. Something may be done under these circumstances to accomplish this end—more, perhaps, than is often believed, of which I have seen some remarkable instances; but sometimes, it must be confessed, such palliative measures are useless, and the patient demands relief from sufferings which are intolerable, no matter what the risk may be. Can we under such circumstances humanely refuse him?

To return however: let us inquire what we can accomplish by palpation or percussion. First, I have determined the fact beyond all question, that there is by no means necessarily much, if any, tenderness in the regions of the ureter and kidney—that is, acute suppuration, active inflammation, or renal calculus not being present. You are accustomed to see how often I examine those regions in the wards. And you know how efficiently one may do it with a patient who is thin and spare; and also how particularly unsatisfactory is the examination when the patient is corpulent. Now the former condition is one you can by no means always reckon upon; on the contrary, I affirm that the latter condition must be more commonly expected in these cases. For a year or two, perhaps, the patients have been inactive, and fat has accumulated; and then you can learn little about the ureters by palpation. Again, the condition of the organs, even in the spare subject, offers no objective sign to physical examination. Let us suppose a ureter as big as the aorta, or larger still: is it a tube filled with air like an intestine which will give you a corresponding note? Is it filled with fluid, and will it thus give you a line of dulness which may be traced? By no means; it is a flaccid sheath with thin yielding walls, transmitting fluid it is true, but you can no more isolate it by percussion from the adjacent structures, so as to demonstrate its size, than you can isolate by a similar process—let me say, the lumbar plexus. Of the kidney itself the same thing must be affirmed. You may, if fairly practised, determine the solid mass of an enlarged kidney; but there is no way of demonstrating the existence of a dilated pelvis or of thinned kidney structure by any physical

examination. No doubt you may guess—shrewdly perhaps sometimes; but it is no place or time for guessing when life or death hangs on the decision. There is a field here for further research; the door is open for investigation. For, you may rely on it, no method of arriving at anything like a certain diagnosis of pyelitis with mechanical distension is at present known.

2. But I have now to consider what influence ascertained disease of the kidney exercises on the prognosis, when the subject of it has also a stone in the bladder, and the question of operating for its removal has to be considered. Let me first say that when the stone is small—the size of a small nut,—whatever the condition of the kidneys, there is no very great risk from lithotrity if well performed. But it is by no means always that we are so fortunate as to find the patient with a small stone. It may be large, and do what you will the patient is in a position of danger; the only question for us is—by what treatment will that danger be least?

I have operated certainly in three cases in which advanced Bright's disease was known to be present, but in which the sufferings of the patient were so great that an operation was most desirable. In each the stone was phosphatic; in the first and second it was large, in the third of medium size.

The first was a gentleman whom I saw with Dr. Sharpe, of Norwood, in 1865. With extreme care I removed the whole in eight sittings, with great relief to the patient. His urine, although fairly clear, was of low specific gravity, and charged with albumen. The subsequent part of his life—I believe about six or nine months—was rendered comparatively comfortable. The second case was in this hospital in 1870. He was also handled with the utmost caution, having five sittings in ten weeks, owing to the severe rigors and prolonged fever which followed some of them; but he went out marvellously improved, and lost all his calculous symptoms. I saw him three months after, and he fully maintained all he had gained. I have heard nothing since.

The last of the three occurred about the same time, also in the hospital. His disease was more advanced than that of the preceding case. Only on his very urgent solicitation I consented to try lithotrity. I could not resist the appeal to diminish his suffering if possible; that he must die at no distant time both he and I knew. With his pallor, debility, and uniformly rapid pulse, lithotomy could not be thought of for an instant. I kept him three weeks before touching him, in the hope of improving his condition. Five sittings sufficed to remove nearly all the stone; but the last was followed by severe shivering and vomiting, and death in a few days.

Should I have done lithotomy in any of those cases? I answer unhesitatingly, in not one of them was it possible to submit, with any chance of success, men in such a feeble state to any severe cutting operation. Nothing but lithotrity could offer the slighest chance, and it saved two of them from the anguish of stone, and from the additional proclivity to death which it entailed.

But these you say, were examples of known "morbus Brightii," and you naturally enough demand if I should be guided by the same principle in a case of mechanical dilatation and pyelitis if I knew beforehand that I had to deal with such a one? To this I can only say that the patients whom I have seen, and whose autopsies have demonstrated that they were the subjects of that condition, have been manifestly defective in vital power—patients for whom I should certainly shun a cutting operation of any kind if possible. Although as I said on another occasion, had we the means of identifying an advanced example, I should gladly avoid either lithotomy or lithotrity, still I believe that I have employed the latter with success for a few. I have thus operated three times in cases of bad old-standing stricture of the urethra (maintaining the urethra well dilated by a catheter permanently tied in for the purpose, as you have seen), in which I have no doubt that considerable mechanical distension of all the passages existed. But these people were so miserably feeble that nothing would have induced me to cut them, nor do I think that any man would have ventured to do so.

But you may still rejoin, and you will be quite right in doing so, surely it has been said by surgeons of experience in the past, that when "renal disease" exists, it is better to remove the stone by one operation, although severe, than to attempt it by a process which requires repeated introductions of a lithotrite, and a more or less continued irritation from fragments? The fitting reply to-day, as it appears to me, is, that although this was undoubtedly true some thirty years ago, it is by no means necessarily true now, when the relative capabilities of the two operations of cutting and crushing have so greatly changed. The operation of lithotomy had arrived at its present perfection before lithotrity was invented. No results more perfect than had then been attained by its means have ever been accomplished by it since. On the other hand, the perfecting of lithotrity has been a progressive process from fifty years ago to this very day. The lithotrity of to-day is a better and safer proceeding than that of twenty or of ten years ago, and thus it is that the axiom about renal disease, right as it might have been then, has been growing less so year by year. *I believe it is reversed for stones which may be easily crushed.* In support of

this conviction I have called before you six unimpeachable witnesses—I might easily have called more,—six patients who could not have been cut. To have placed those feeble and pallid frames on an operating table for lithotomy would have been to slaughter them outright. Of those six, five were saved. I believe, then, that for any stone of rather large size, *provided it is friable*—and calculi in these cases are mostly phosphatic, and therefore friable,—in a patient of broken health from advanced renal disease, if any chance exists from operation at all, it will be by lithotrity; and that in such a case lithotomy will be surely fatal. The choice in a bad case is lithotrity or palliative treatment; with a stone not easily crushed, it is lithotomy or palliative treatment, probably the latter.

But then it is impossible to overlook one condition, and it would be useless affectation to do so. I mean by lithotrity an operation carefully done by an experienced hand. Rather than have it done in any other fashion, let lithotomy be selected by all means. It is impossible to compare these two operations as we do some others—as we can, for example, any two modes of amputating a limb. Nor may we blink the fact that, while the lithotomy practice of one good surgeon may not differ greatly in the long run from that of another, it is impossible to deny that the lithotrity of the two may be wide as the poles asunder in its quality as an operation and as to the chances which it may offer to a patient. Thus it is that a bold, well-performed lateral lithotomy is quite possible to the young surgeon at the outset of his career, while nothing but considerable experience can make him a good lithotritist. The two operations can never be compared, nor their capabilities estimated, without keeping in view this fact. You whom I address had better, when in practice in the country, decide in difficult or doubtful circumstances to cut rather than to crush, until you have acquired some facility in the practice of the latter art, unless indeed the stone be quite small. Do not touch with the lithotrite in any circumstances a stone which is rather large until you have had experience with a small one or two.

One great practical point remains, always recurs, and at last comes uppermost, on whatever side the great subject is considered. It is this: Detect the existence of a stone in the bladder early: it is always somebody's fault if not found early. The stone will then be small. It may be crushed at one or at most two sittings, with almost no risk. No question of cutting need ever arise; the presence of kidney disease need scarcely trouble you. I never in my life lost a patient, whatever his condition, whose stone was found and crushed when it was small; and I never expect to do so.—*Lancet, March* 8, 1873, *p.* 331.

53.—ON THE REMOVAL OF FOREIGN BODIES FROM THE MALE BLADDER.

By Dr. George H. Porter, Surgeon in Ordinary to H. M. in Ireland, and Senior-Surgeon to the Meath Hospital and County Dublin Infirmary.

[Few foreign bodies are met with in the male bladder, with the exception of portions of bougies or catheters.]

For the removal of foreign bodies which cannot be extracted along the urethra, lithotomy through the middle line of the perineum is *par excellence*, the operation to be chosen. The highest authorities agree on this point. Mr. Erichsen says—"This is more safely done by the median than by the lateral operation of cystotomy." Ashurst states, when treating of foreign bodies in the bladder—"In the male, however, it is usually necessary to resort to lithotrity (if the nature of the body admit of its being crushed), or to lithotomy, the *median* being in such a case the preferable operation." Again, Mr. Bryant writes—"In adults, possibly, the median operation may be chosen when the foreign body is not large."

There is a difference of opinion amongst surgeons as to the best way of reaching the staff, and by it the bladder, in central lithotomy. Allarton plunges his knife at once, with its back to the rectum, into the membranous portion of the urethra, placing the point of the bistoury half an inch in front of the anus. In the old "Marian" operation a cut was made on the right or left of the raphe upon the staff, beginning below the scrotum, and terminating an inch above the anus. Sir Henry Thompson says—"Respecting the modes of making the incisions, I prefer dissecting from the skin inwards to the staff, as in other operations, to the method by transfixion." He does not mention where he begins his incision through the skin.

Mr. Erichsen recommends a rectangular staff, resembling Buchanan's, to be used, and considers that "the surgeon can judge of the exact point where to enter the knife (directing it so as to open the groove just below the angle) which he cannot do with the curved staff."

I consider the recommendation of Sir H. Thompson, to cut from the skin inwards, most useful, particularly when the perineum is deep. In such a case the whole blade of the knife would be swallowed up if driven to the staff, according to Mr. Allarton's advice, and the heel of the blade would be brought to bear on the tough skin of the raphe; whereas the free division of the integument, in the first instance, facilitates the further separation of the structures to be cut through.

The operation I have four times successfully performed, and which I take the liberty of suggesting to others, is a combination of Allarton's and Thompson's; but differing slightly from both. It is briefly described as follows:—The staff, grooved on its convexity (and as large as possible) having been introduced, kneeling in front of the patient, I insert the forefinger of my left hand into the rectum with its palmar surface upwards, and fix it against the staff at the apex of the prostate gland. I then push Allarton's bistoury about a quarter of an inch in depth with its back to the bowel, half an inch anterior to the anus in the raphe, along which I then cut one inch and a half in length towards the root of the scrotum, freely dividing the skin, and superficial fascia. This having been done, I return the point of the knife into its first starting place, and quickly plunge it to the staff at the apex of the prostate, making sure that I have freely opened the urethra, by moving the bistoury in the groove of the staff. I then cut forwards to the extent of the superficial incision. Still keeping the staff steadied with the point of the finger in the bowel, I introduce a long steel probe along the groove of the instrument into the bladder. Then having withdrawn the finger from the rectum, I introduce it on the probe, and dilate the prostate by insinuating the finger with rotary motion. This being accomplished, the forceps is passed in on the finger, the foreign body caught, and at once extracted. The following cases of foreign bodies in the bladder, and the surgical exertions for their removal, may be interesting to the profession:—

Case 1.—*Tight Organic Stricture of the Male Urethra; a large Portion of a Catheter lodged in the Bladder; the Stricture forcibly dilated; the Foreign Body extracted; Recovery.*—T. C., aged forty-three years, a married man, had suffered for three years from tight organic stricture of his urethra about four inches from its orifice. It was caused, apparently, by an injury received nine years before. He had it dilated on several occasions by different modes of treatment, but it always showed a great tendency to close again. He had been three times attacked with complete retention of urine, and was with great difficulty relieved. He was in the habit of introducing bougies himself, and allowing them to remain in the passage for some hours, and for the last two years felt satisfied with his own treatment without applying to a surgeon. He was never able to force a bougie larger than No. 4 through, or rather into the stricture.

On the 28th June, 1872, he came under my observation, and gave the following details:—He had cut off about five inches and a-half of a French bulbous catheter, which he forcibly pushed into the stricture, where he left it so tightly grasped, that he thought it impossible for the instrument to come out,

or, on the other hand, to glide backwards into his bladder. He went out for a drive of two hours' duration, and on returning home discovered to his great alarm that, instead of remaining as he had placed it, the piece of catheter had worked its way through the stricture, and lay partially in his urethra and bladder. I thus found him in a state of great anxiety, complaining of acute pain in the region of the bladder, with a constant desire to pass water, which dribbled away on each exertion to avoid it. Pressure on his perineum gave intense agony. Having endeavoured to calm his mind, I had him placed immediately in a warm bath, and administered a draught containing tincture of hyoscyamus, liquor potassæ, laurel water, and camphor mixture. After remaining in the bath for twenty minutes I had him removed to bed, and told him I would endeavour to extract the piece of catheter early the following day. He was desired to repeat the warm bath in the meantime, as also the draught at ten o'clock p.m.

Here was obviously a most anxious case, and one that called for the best consideration prior to the adoption of operative measures. The stricture forbade the introduction of a forceps or lithotrite, to seize the foreign body, and the same difficulty was a bar to my passing a fair-sized staff, on which I might cut into the bladder. After having carefully weighed all the difficulties, I determined in the first instance to dilate the stricture, and then with a lithotrite catch and extract the piece of the catheter; but should I fail in this, at once to cut into his bladder and take it out. June 29th. Assisted by my friends Mr. Wharton and Dr. M'Cormick, I had the patient placed fully under the influence of chloroform; I then introduced "Holt's Dilator," and burst the stricture; on the withdrawal of the dilator only three or four drops of blood followed. I then passed a No. 9 silver catheter, to be certain that a way sufficiently large was made for a lithotrite, and also to push on the foreign body fairly into the bladder, should it be in any degree lodged in the prostatic portion of the canal. The stopper was allowed to remain in the catheter, to prevent the urine escaping, and as I passed the metallic instrument I distinctly felt the offending substance. I then rapidly withdrew the catheter, and replaced it by a small-sized lithotrite, which was with the greatest facility introduced. With this I felt the piece of the catheter lying to the left side of the patient's bladder, and having opened the blades of the lithotrite, I was fortunate enough to grasp it and extract it slowly, but without difficulty. I then drew off his urine, introduced a quarter grain morphia suppository into the rectum, and placed him comfortably in bed, with warmth to his feet. June 30th. He had a quiet night, and was free from vesical irritation. From this

date he made a rapid recovery, and was about his business the sixth day after the operation. Probably no case could be presented more suitable to the "immediate plan" of treating stricture, and certainly the scientific course to adopt was the one which I pursued previous to resorting to the extraction of the foreign body by a cutting operation. The method I adopted was crowned with the most gratifying success.

Case 2.—A portion of a Gutta-Percha Bougie broken off in the Bladder; Calculous Formation around it; a Modification of "Allarton's Lithotomy;" Recovery.—J. M., aged twenty-five years, was admitted into the Meath Hospital under my care, May 8th, 1870. He had suffered from organic stricture for more than twelve months, and had been in the habit of treating himself by introducing bougies. About seven months previous to admission he had constructed a bougie from a piece of gutta percha, and on the first occasion that he passed it into his bladder a portion about three-quarters of an inch in length broke off when he was withdrawing the instrument, and this subsequently became the nucleus of a stone. When he came under my observation he was suffering from all the symptoms of a calculus in the bladder, and his health was greatly broken down. He got very little rest, his urine was loaded with pus, and contained blood. A No. 5 sound was the largest that the stricture would admit, and with this the foreign body was easily found. The contracted state of the urethra, and the highly inflamed condition of the bladder in a man so debilitated, prohibited the idea of removing the stone and foreign body with a lithotrite. I determined to cut it out.

Operation. May 13th. His rectum having been cleared out by a tepid water enema, at 10 o'clock a.m. he was brought into the operation theatre, and put fully under the influence of chloroform. He was quickly tied, and held in the usual position for lithotomy. A No. 5 staff grooved on its convexity was introduced, and firmly held by my colleague, Mr. Wharton. Then, kneeling, I inserted the forefinger of my left hand into his rectum with its palmar aspect upwards, and its point steadily pressing on the staff at the apex of the prostate gland. I then pushed Mr. Allarton's knife with its back towards the bowel a quarter of an inch deep, striking the perineum half an inch in front of the anus. I then cut forwards along the raphe to the extent of one inch and a half, dividing the skin and superficial fascia. I next fixed the point of the bistoury where I commenced my incision, and plunged it (with the cutting edge still away from the rectum) deeply until I lodged its point fairly in the groove of the staff at the membranous portion of the urethra. Having made certain that I had safely entered it, I cut forwards to the extent of the superficial incision. I then

laid aside my knife, but still keeping my left forefinger in the bowel, I passed in through the wound a long steel probe, which I caused to glide along the groove of the staff into the bladder, proving that I was in the proper course by striking the end of the probe sharply against the stop at the extremity of the staff. And here let me recommend in the strongest manner the advantage of using a staff constructed with this abrupt resisting point in every mode of lithotomy, whether the surgeon hits it with the point of his knife in the lateral operation, or with the end of the probe as in the procedure under consideration; it proclaims that he has travelled the direct route, and is safely in the bladder. I then had the staff removed, and at the same time withdrew my finger from the rectum. Still firmly holding the probe with my right hand, I inserted my left forefinger (which had served whilst in the bowel to direct the knife in safety to the staff) along the probe into the bladder, and by rotating it two or three times I largely dilated the prostate. I felt the foreign body lying at the bottom of the viscus, below the level of my finger. I then took out the probe, and on my finger insinuated a small lithotomy forceps, with which I quickly seized the stone, and brought out a large portion; it broke, however, under the grasp of the forceps, so that I was obliged to remove the remainder of it by a second introduction of the instrument. I was aided by a careful washing out of the bladder by means of a strong syringe. The patient was now placed in a well-warmed bed, and had a morphine suppository passed into his rectum, and directions were given to keep him as dry as possible by placing folded sheets under his buttocks as often as required. The amount of bleeding was remarkably trifling, and the wound needed no dressing. May 14th. He had a most refreshing night, was free from the constant calls to micturate which disturbed him before the operation; his urine flowed freely through the wound, and his pulse counted only eighty; he did not suffer from any febrile symptom. May 16th. He expressed himself as greatly relieved, all feeling of bladder irritation had subsided, and the urine passed constantly through the wound. It would be tedious to relate the daily condition of the patient; he improved in health rapidly, the urine began to flow through the urethra on the sixth day after the operation, the wound closed in the most healthy and satisfactory manner, and he left the hospital cured four weeks after the removal of the foreign body.

Case 3.—*Nine inches and a half in length of a Gum Elastic Catheter lodged in the Male Bladder and surrounded by Phosphatic Deposit; a Modification of Allarton's Lithotomy; Recovery.*—J. T., aged thirty-eight years, by trade a plumber, was admitted into the Meath Hospital, under my care, November

28th, 1872. He had suffered from stricture of the urethra for two years previous to his admission into hospital, and had himself been in the habit of passing bougies and catheters occasionally during the last eighteen months of that period. Nine weeks prior to coming under my notice, in withdrawing a gum elastic catheter (No. 6), which he had introduced, it broke across, leaving one inch and a half of the instrument between his fingers and thumb. The larger portion he immediately tried to take out of his urethra, but failed in the attempt, and, in about an hour afterwards, it slipped into his bladder. For two days subsequently he felt no annoyance, and was able to follow his usual occupation. On the third day, however, after the accident, he felt great pain during, and at the termination of, micturition in his glans penis; his urine was bloody, and any sudden motion increased his suffering. He placed himself under the care of a surgeon, who commenced to dilate the stricture before attempting the removal of the foreign body; but the patient became anxious for speedy relief, and left the hospital while he was undergoing treatment. He then applied to my friend Dr. Trimble, of Castlebellingham, who detected the foreign substance in his bladder, and recommended him to come to me.

On admission to the hospital, I found him suffering from frequent calls to make water, so often as ten times during the night. His urine was bloody, and contained pus and ropy mucus. One small piece of the exterior of the catheter had been expelled, and numerous fine fragments of phosphatic deposit also came away. Nov. 29th. I sounded him with Sir Henry Thompson's sound, and soon felt the catheter which, on being struck, gave the sensation as if it were more or less encrusted with calculous matter. I ordered him to remain in bed, and prescribed sedative medicine, with diluent drinks. In consultation with my colleagues, it was considered a case not suitable for an attempt to extract the foreign body by the urethra. The catheter, it was considered, might break (if caught in a lithotrite) into pieces, which could not be washed away with the flow of urine, but remain to form the foundation of other deposits. And even if it did not thus become disintegrated, it could not be drawn through the urethra in its coated condition without lacerating the canal to a dangerous extent. The highly inflamed state of his bladder also prohibited such instrumental interference. I therefore decided upon performing the operation which I have above described, and which I strongly recommend. I operated on the morning of December 4th, and removed the portion of the catheter. The operation was done under the influence of ether, which was kindly administered by my colleague Mr. Smyly in a very

efficient manner. The patient made a very satisfactory recovery. The urine passed through the penis on the fifth day, and he left the hospital, with the wound healed and in fine health, on the 7th January, 1873.

Remarks.—The accident of a catheter or bougie slipping backward into the bladder is by no means so uncommon as is generally supposed; and every surgeon should carefully examine instruments prior to using them. Age renders them brittle and unfit; and, even when their condition is sound, the utmost precaution should be adopted (when allowing them to remain in the urethra) to secure them in such a manner that they cannot recede, or glide forwards from the canal. When a portion of a soft bougie or catheter is for a short period lodged in the bladder, it is not an easy procedure to feel it with a sound; and this fact is alluded to by Mr. Fleming, a gentleman who has devoted much attention to injuries and diseases of the urinary organs, in his description of a case in which a bougie—which had been introduced and left in the urethra—escaped into the bladder.—Dub. Hosp. Gazette, Sept. 1, 1858. A very interesting case is reported by my friend, Mr. William Stokes, Professor of Surgery in the Royal College of Surgeons, in the first number of the Irish Hospital Gazette. This was a case of the removal of an *entire* gum elastic catheter from the bladder by Allarton's operation.—*Dublin Journal of Med. Science, Feb.* 7, 1873, *p.* 106.

54.—ON THE TREATMENT OF STRICTURE OF THE URETHRA.

By Sir Henry Thompson, Surgeon-Extraordinary to H. M. the King of the Belgians, Surgeon and Professor of Clinical Surgery to the University College Hospital.

I propose to examine the question of treatment only—the treatment of that organic change in the walls of the urethral canal which constitutes stricture, and especially when it occurs, as it most commonly does, at or near the bulbous part, a region which may certainly be comprised within two inches of the canal, and which may be said to commence at about four inches from the external orifice. When stricture occurs at the orifice, or within the anterior two or three inches of the urethra, it differs somewhat in regard to the treatment necessary for the common or typical stricture seated further down, but this will be referred to hereafter. Unless specified to the contrary, then, I speak here of the common form thus indicated.

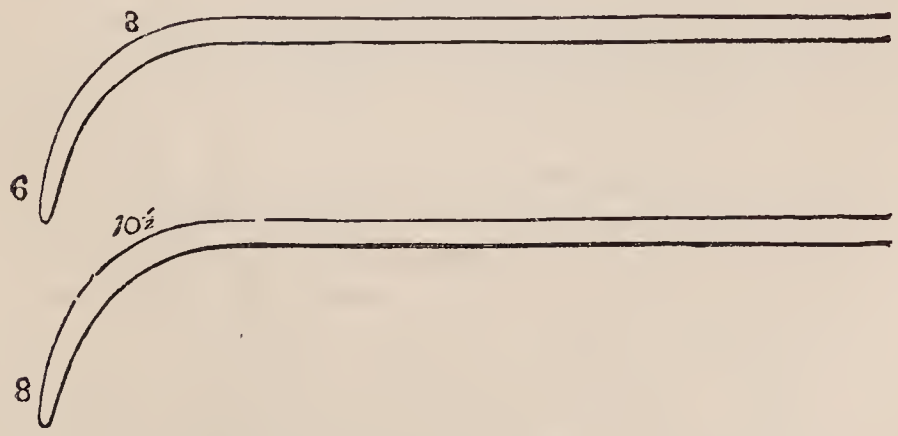
A patient who has not long been the subject of stricture may, as a rule, be successfully treated by simply passing soft

instruments, gradually increasing their calibre until nearly that of the healthy urethra is attained. This is called simple dilatation. The choice of instrument is important. A soft, flexible, conical bougie, with a small bulbous extremity to prevent what would otherwise be the point or apex of the cone getting entangled in one of the many small cavities in the walls of the passage, is on the whole, the best, at all events up to a certain stage. But these very qualities of softness and flexibility, which diminish so greatly the disagreeable sensation when passing and the chance of injury to the patient, and which render these instruments so valuable, constitute them inefficient when you arrive at a point at which the hardness or resistance of the stricture is too great for their power of penetration. What is the next step? What substitute do you employ? Are you to relinquish the process of dilatation, and think of performing any operation? By no means. You will now resort to the firmer and less flexible instruments; and there are few which are more efficient or easy to pass, at this stage, than the conical steel instruments, which are all the better when silver plated. The sizes which I should recommend you are not to be small—indeed, none smaller than the following, of which I don't know that the first is not too small for any but very careful hands.

The first, say No. 6 (English scale) at the point, gradually increasing to No. 8 at about two inches and a half from it, as represented in Fig. 1.

The next, No. 7	at the point,	and	No. 9	at the largest	part.
The next, No. 8	,,	,,	No. 10	,,	,,
The next, No. 9	,,	,,	No. 11	,,	,,
The next, No. 10	,,	,,	No. 12	,,	,,
The next, No. 11	,,	,,	No. 13	,,	,,

Fig. 1.



These conical dilators—I scarcely like to call them "bougies," a term so inappropriate for metal instruments, and which cer-

tainly, if retained at all now that the thing itself, the wax candle of our forefathers, is obsolete, should denote only flexible instruments—may be passed with great ease owing to their polish and weight; while they can scarcely be surpassed for efficiency in the later stages of dilatation. I recommended them equally twenty years ago, and have in no way changed my mind about them. You may, however, like something intermediate between the very flexible bougie and these metallic dilators; and many means for combining the flexibility of the former as to the point, and the stiffness of the latter as to the stem, have been contrived—such as gum elastic, flexible metal, &c. Of late I have adopted a plan which I prefer to those, and for all sizes from No. 4 to No. 8 or 9 (English) it is perhaps better than any. I have had a short and very soft lead stylet, made to be introduced at pleasure into the interior of the French conical bougie, and terminating in a fine point, which stops short about four inches and a half from the end of the bougie. Here is a set of them: six in all. The following diagram will explain what I mean. A section shows the moveable lead stylet in the interior, but is represented as extending much too close to the end, which should be long and flexible. (Fig. 2.)

Fig. 2.

Their maximum diameters are about $5\frac{1}{2}$, $6\frac{1}{4}$, 7, $7\frac{3}{4}$, $8\frac{1}{2}$, and $9\frac{1}{4}$ inches—a series which may well intervene between the soft bougies and the metallic dilators. Capability to penetrate easily is ensured by the complete flexibility of the point, and the increased firmness of all the rest of the instrument.

It may be as well perhaps just to advert to the fact that we require also a delicate metallic instrument to penetrate where a stricture is very small and tight. When I find that no stream exists, that a mere succession of drops is the only method by which relief is attained, I try at first a very small gum catheter, the smallest that handicraft can produce, a No. $\frac{1}{2}$ of our scale; and if with a little coaxing this cannot be passed—and it very often can, to the great advantage of the patient, since it can be tied in and retained without risk or pain,—I resort at once to a very small silver catheter, the point of which can be guided with great care through the narrow orifice, on the system I have in another lecture described to you, and will not repeat here. If this be safely accomplished, you will do well to tie it in for forty-eight hours or so, keeping the patient quite quiet in bed, and replacing it then, if it is loose, by a gum instru-

ment. You may continue the process of "continuous dilatation" by tying in one after another until you have reached No. 8 or 9, as you will do in a few days, if the patient desires to be dilated rapidly and can give complete leisure to the treatment. If, however, he desires not to be a prisoner, or to continue his avocations, you substitute the ordinary dilatation —that is, the passing an instrument every two or three days, removing it immediately after it has been passed, and letting him go about his business as usual. The early stage of dilatation passed, you will go next to the French flexible instruments, and then onwards as already described.

So much for dilatation. As to the occasional occurrence of rigors and other troubles, I have discussed them fully with you already. The mechanical question is our only subject to-day. But supposing that, although you have succeeded in dilating the urethra up to a fair size, the narrowing rapidly returns in spite of periodically passed instruments; or that difficult micturition still exists; or that retention of urine often occurs: is it not clear that something further is necessary? In other words, if dilatation proves insufficient, what then? This question I propose for the next part of my subject.

The mechanical modes of overcoming a narrow and contractile stricture when dilatation has proved insufficient may be for the most part regarded as of two kinds—rupture or forcible distension of the opposing tissues by power exerted from within outwards; or division by a knife in some form, and applied generally within the urethra, occasionally from the external surface.

The method by rupture introduced by Mr. Holt has been largely employed for the treatment of strictures of various degrees of severity. It is an operation generally involving but little risk, although it has been sometimes followed by fatal consequences. My principal objection to it is, that the benefit obtained is certainly not very enduring in severe cases of stricture, and it is for such only that operative measures are necessary.

I cannot say much more for the forcible "over-distension" proposed by myself, and now practised much and, as would appear, successfully in America. By both these methods an admirable result is achieved at once, and the former method especially is so simple in execution that it can be applied by an almost unpractised hand. I am not at all certain, however, that it is an advantage to the patient that an operation should be so easily applicable by an inexperienced practitioner. The consequence has been, and not so very seldom, that the operation has been performed, owing to such inexperience,

on patients for whom no operation of any kind was ever necessary.

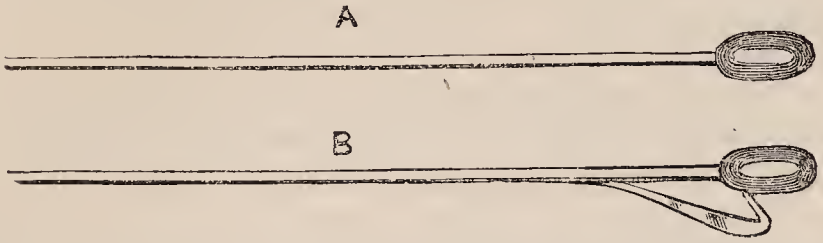
[A most ingenious instrument for division of stricture is that of Dr. Corradi, of Rome. It consists of what appears to be a small silver catheter. After introduction a screw in the handle is turned and a strong wire issues laterally from the lower third of the instrument forming the chord of an arc with the curved portion. The wire, however, does not divide a hard stricture and only teazes and inflames it.]

Now for the most severe forms of stricture—those in which, after a duration of many years, the constituent tissues are so tough and so resilient that the mere introduction of a bougie only augments the patient's symptoms—I have found nothing so efficient, so safe, and so certain as internal urethrotomy. I by no means say any kind of urethrotomy. Anything short of complete division of the hardened tissue is not efficient. Over-distend these strictures, or tease them with dilatation in any fashion, and they are rendered more than ever unmanageable, and you only provoke an attack of rigors, and sometimes prolonged constitutional disturbance of a severe kind. For this operation we have numerous instruments and systems to choose from; their name is legion. Modification after modification has been made of the earlier forms of urethrotomes, both by instrument makers and by surgeons, with the view of accomplishing more perfectly the original design, which is that of ability to divide easily, and more or less freely, the hardened tissue.

One of those early forms I still prefer, that of Civiale. I do so on account of its extreme simplicity. With but little of mechanism, it responds like a scalpel to the hand. In fact it is merely a long-handled knife, with a delicate little blade, which being passed, sheathed, to the other side of the stricture, is then unsheathed and drawn through it; and the extent, whether of depth or length, of the incision is regulated with ease and accuracy according to the will of the operator. This, in my opinion, is far better than a machine which makes a certain incision mechanically, and is not controlled and guided by the intelligence of the surgeon.

The method of performing it is as follows:—First, you will ascertain by measurement precisely where the stricture is; its distance from the external meatus. Secondly, you must ensure that the stricture is, at the time of the operation, sufficiently patent to admit the bulb of the urethrotome to be passed through it. This is an important point, and I must dwell on it for a few moments. Let me remark that the bulb of this urethrotome, as made in Paris, is much larger than it ought to

be. The instrument I employ is modified thus:—The bulb is only the size of No. 5 or 4½ (English scale), instead of No. 7, the usual French size. The stem of mine equals in size only No. 3, and the instrument is at least one inch and a half shorter (see Fig. 3). Now as the stricture which you have to



Urethrotome described in the text. The upper figure shows it closed, the lower open.

treat probably admits only No. 1 or 2 at the most, it is necessary to tie in a small gum catheter for two or three days or more previously, so as to dilate it temporarily, which is always practicable, and bring the stricture to the requisite size for admitting the bulbous end of the urethrotome to pass through it. However contractile the stricture may be—that is, liable to narrow speedily after dilatation, you can always thus temporarily dilate it for our purpose. Of course, if the stricture in question were susceptible of *durable* relief by dilatation, it would be unnecessary to do more, and you would not think of dividing it. Having then arrived at a calibre of No. 4 or 5, by tying in, I prefer to give the patient chloroform. I then withdraw the inlying catheter, and at once pass carefully the bulb of the urethrotome through the stricture, which usually requires a little gentle pressure and management, when the little bulb is felt free and moveable in the urethra on the further side. In this situation I make the blade project to the requisite extent by means of the simple mechanism in the handle which I show you, and, directing the edge to the floor of the urethra, press it firmly there and draw it boldly outwards, so as to make an incision, say, an inch and a half or two inches in length, and by this means divide all the thickened tissues which constitute the stricture. You feel them sometimes offering much resistance. Take my word for it, you need not fear freedom of incision. I never saw any serious harm of any kind produced, although I have seen less success resulting than I desired when I have not sufficiently divided the stricture, as may have been the case in some of my earlier experiences, and have so left a fibre or two uncut. But I have never had occasion to regret a free and complete division. Next you introduce a No. 13 plated sound, not conical, which should go quite easily into the bladder, and not be in the least "held" on

withdrawing it. Keep along the upper portion of the canal, and the point of the instrument will not get into the incision. Then take a No. 11 or 12 well-curved gum catheter and pass it into the bladder, tying it there in order to retain it forty-eight hours. It is best to introduce it on a well curved stylet to avoid the wound, which otherwise the point of the instrument might get into. Of course the stylet is withdrawn immediately afterwards.

Now in all the operations I have done—nearly two hundred in number—I have never seen any bleeding to signify. Sometimes only a few drops appear. On two occasions I have had some extravasation of urine when the catheter became displaced, but not nearly so bad as I have seen following "rupture"; and once only an abscess has followed. And you yourselves can also form a judgment to some extent of these questions, since you must have seen at least twenty cases of this operation in the wards during the last twelve months. Once only have I seen a death after it, and that was in one of the worst cases of old and unrelieved disease which we have ever seen, in one of my wards, about a year and a half ago, in which I used it as a forlorn hope.

It is not uncommon to have an attack of fever, which also happens not unfrequently after the use of the lithotrite, but it is by no means the rule. It appears, if at all, after the withdrawal of the inlying catheter; the first time the patient passes his urine a drop perhaps enters what remains of the incision, and he has a rigor in an hour or two's time, and that is all. To avoid this as much as possible I always adopt the following plan: I withdraw all the urine, of course, when removing the catheter, forty-eight hours after the operation; order the patient a hot hip bath for fifteen minutes, and send him back to bed to be well covered up, with instructions not to pass water until he feels a manifest desire. This will probably not occur until six hours after the instrument has been withdrawn. He then stands up, makes a full stream, is generally very much astonished at its volume and the ease with which it flows, and goes back to bed as before for the day. Following these precautions, you may hope he will escape the rigor; but if not, you know, at all events, that there is no risk and no ground for anxiety. Sometimes—but this is quite exceptional—the fever is somewhat more severe and prolonged. The subsequent treatment may be briefly sketched: On the fourth day after the operation pass a conical French bougie with a large bulb, so as not by any means to open the little wound. If the point is felt in the slightest degree to encounter an obstruction, withdraw it and pass a well-curved gum-elastic instrument, which is not conical; the former, however, usually suffices.

Again in three or four days, Nos. 11 and 12 mostly pass with considerable ease. After this once a week, and the patient will pass the instrument himself at increasing intervals, ultimately arriving at, say, once a month.

This operation gives, I believe, more lasting results than any other. You have seen me perform it for cases which have experienced every known treatment, and have become as bad as ever. I do not claim for it the removal of organic contraction—that is impossible. The treatment has yet to be devised which will remove absolutely and for ever the occurrence of recontraction in a patient once the victim of an organic stricture.

A few words relative to strictures within two or three inches of the external meatus. As a rule they are very non-dilatable, and the best treatment is incision. They are close to the hand, and nothing is easier than to divide the obstruction by means of a small bistourie cachée. No doubt one reason why they are so little acted upon by the simple bougie is that the urethra here is so little surrounded by spongy tissue, and so much by firm fibrous tissue, that there is really less room for dilating, and less of that soft tissue which exists so abundantly around the bulbous portion. The operation in question is so simple as not to require further illustration here, and the rules I have laid down for the performance of internal urethrotomy may be held as applying in these cases also.—*Lancet, Nov.* 30, *and Dec.* 7, 1872, *pp.* 669, 805.

55.—ON A NEW METHOD OF TREATING RETENTION OF URINE AND IMPASSABLE STRICTURE.

By Furneaux Jordan, Esq., Surgeon to the Queen's Hospital, and Professor of Surgery at the Queen's College, Birmingham.

[With care, skill, perseverance, and time, the cases of stricture in which an instrument cannot be passed are very few. Now and then operative interference is needed, and usually either vesical puncture or perineal section is resorted to. The operation to be described is intended as a substitute for either of these. The following case is an illustrative one :]

A man past middle age came into the Queen's Hospital with a distended bladder and some dribbling. Careful and repeated efforts to pass instruments failed. I then carried the left forefinger and a curved sharp-pointed bistoury into the rectum. I thrust the point of the bistoury forwards through the anterior median line of the rectum, an inch and a quarter from the anus, into the membranous part of the urethra, and drew it

forwards for a short distance through the incision. I readily introduced my finger into the urethra, and could bring it to the stricture in front or carry it backwards into the bladder. Directing the tip of the finger to the stricture, I conducted a probe-pointed French bougie (six, English scale) along its concavity. It passed forwards through the stricture with unexpected ease and emerged from the end of the penis. One end of the instrument was now at the urinary meatus, the other at the anus. The ivory open end was cut off smoothly, drawn into the urethra, and carried by the finger backwards into the bladder. The urine flowed freely, at first through the incision and then through the catheter. The catheter was retained twenty-four hours. A few feet of small India-rubber tubing conducted the urine to a convenient vessel. At the expiration of twenty-four hours the catheter was withdrawn, and a No. 8 was passed with difficulty through the meatus. In a day or two a No. 12 bougie could be passed with ease. He was now allowed, for a few days, to pass urine by natural efforts. With each act of micturition, a little urine entered the rectum. The next step was to close the rectal fistula. The urine was drawn several times during the twenty-four hours, especially before each act of defæcation. The wound, thus kept from contact with the urine, closed completely in eight days. The man himself discovered his good fortune by passing urine, against orders, on the eighth day. He entered the hospital haggard, wasted, feeble, and at death's door. He is now in good health.

When I first entertained the idea of treating stricture from its bladder side, the question arose whether I should pass an instrument from the bladder, incising it close to the prostate for the purpose, or from some part of the urethra behind the stricture. My first impression was, that it would be practicable to make a limited incision into the bladder through the rectum at the spot usually selected for puncture with the trocar. In the dead body, without stricture, everything occurred as I expected it would. It was quite easy to make a limited vertical incision close to the base of the prostate; the tip of the finger, introduced through the incision, immediately came into contact with the vesical orifice of the urethra. Along the concavity of the finger, a French bougie passed readily forwards through the urethra, and made its escape at the external meatus. But on the living man, with an old stricture and a largely dilated membranous urethra, everything was different. I found in the case above cited, that the prostate gland was carried a considerable distance backwards and upwards into the pelvis. I did not remember to have seen any reference to such a condition in surgical writings; but a moment's consideration told me that such an altered position of the prostate

must necessarily be present not only in the case under treatment, but in every case of dilated membranous urethra. The explanation is close at hand. In front of the membranous urethra is the triangular ligament. It is clear that this, with its strength, tension, and attachment to the pubic arch, and the penis in front of it, cannot be driven forwards to any appreciable degree. The dilatation of the urethra occurs in all directions—longitudinally as well as laterally, longitudinally possibly even more than laterally. It follows that the older and more neglected the stricture, and the more dilated the membranous urethra, the further backwards must the prostate be thrust.

The bearing of this altered position of the prostate gland on the ordinary operation of puncturing the bladder by a rectal trocar is very important. The prostate is driven nearer, perhaps close, to the peritoneal cul-de-sac. Puncture of the bladder under such circumstances is likely to endanger the peritoneum with a too certainly fatal result. It once happened to me to be made acquainted with three cases of puncture of the bladder by the rectum which were successively fatal; this, too, in competent hands.

Bearing in mind, then, the dilated membranous urethra, the deeper and more dangerous position of the prostate gland, and repeated experiments on the subject, I am led to prefer, as a rule, opening the urethra in front of the apex of the prostate gland. The ordinary puncture by the rectum merely relieves the retention. It is near, sometimes unavoidably through, the peritoneum. It is not unfrequently fatal. Perineal section of any kind is mostly, in the opinion of all experienced surgeons, a difficult, deep, and often unsuccessful, dissection. The operation I have just performed is a simple incision through only a thin wall of tissue, free from important vessels or erectile tissue.

It is beyond all doubt that an instrument must pass more easily the way the urine flows, as it is beyond doubt which way water can be most readily passed through a funnel. Every fold, ridge, ruga, orifice, or lacuna inclines towards the meatus. A hundred thousand acts of micturition have driven these all one way. The stricture itself is a funnel, the smaller end of which is directed outwards. False passages are often present in old and difficult cases; they lie anteriorly to the stricture. Should the surgeon prefer to pass an instrument from the meatus, the finger placed on the bladder side of the stricture, enables him to guide it with an accuracy otherwise unattainable.

As regards the case and certainty with which the membranous urethra can be opened from the rectum, let me observe that I have never failed to open even the flaccid and collapsed tube

in the subject; in old and impassable stricture, the membranous part of the urethra is, as a rule, dilated. In the cited case, I passed the bistoury on the finger. The rectal speculum may be used instead of the finger.

After opening the urethra, the treatment which I adopted was "continuous dilatation;" this will probably prove the most generally useful. The same incision may, however, prelude the treatment of the stricture by rupture, excessive dilatation, internal incision, or escharotics by instruments carried through either the rectum or the urinary meatus.

A word on the "continuous dilatation" treatment. With the French flexible instruments, this treatment is admirably efficient and quick. It has this great advantage—in old stricture with probable renal disease, it gives rise to less shock than any other kinds of rapid treatment, valuable as many of them are. The illustrious Liston had a contempt for flexible instruments. I hope you will agree with me in the opinion that the Flood, as I have said elsewhere, did not come after him, and that Providence has been kind enough to permit surgery to make advances since his death.

It may happen that instruments will be purposely devised to act on stricture through the rectum. It is certainly desirable, if it be practicable, to have at hand French catheters and bougies made alike—that is, probe-pointed at both ends, so that the end which is drawn into the membranous urethra may be readily pushed backwards into the bladder.

I do not think there is any danger of a rectal fistula. A clean incision without loss of substance would probably heal in time, even if left alone, if the stricture be well dilated, as the lithotomy wound heals. It would not be difficult to close the wound with sutures at the time of the incision, or by a later operation. Perhaps the simplest and best method of closing the fistula is the frequent use of the catheter—a method which is very certain to succeed. If an exceptional difficulty in closing the opening occurred to me, I would draw off every drop of urine, divide the anal sphincter on one side, and keep the bowels quiet.

Another advantage in the operation which I have brought before you is worth alluding to. The curved-pointed bistoury in your pocket-case, or even a common penknife, might enable you to save a man from extravasation of urine, or even death, if you had no other instrument at hand.

But suppose, when you have carried your finger into the membranous urethra, you are unable to pass an instrument forwards through the stricture. Should this occur, which is unlikely, I should introduce a catheter through the rectum, the wound, and the prostatic urethra, into the bladder, and retain

it there for a time. If it slip out, you can easily introduce it again. Puncture of the rectum sometimes requires to be repeated frequently. After a little rest, the instrument would probably pass forwards through the stricture. With a funnel-orifice and probably false passages in front, an instrument will always pass more readily forwards than backwards.

When I say that a finger can readily be introduced into the urethra, I am not speaking of very large fat fingers; but probably even with these there would be no great difficulty. Bear in mind, the living urethra is much more dilatable than the dead.

Bear in mind, too, as we are again speaking of anatomy, of the diversity presented by the shapes, sizes, relations, and curves of all our internal organs. In the pelvis, as elsewhere, every anatomical peculiarity is as individual and varied as are our noses or chins. Do not, therefore, underrate the value of anatomical knowledge. Anatomy itself—not ignorance of anatomy—teaches anatomical diversity.

The operation which I have just described I believe to be simpler, safer, and more efficient than the alternative operations commonly adopted for the treatment of stricture of the urethra. We must not forget, however, that old and neglected stricture is usually accompanied by disease of the kidneys. If this disease be advanced, the performance of any operation whatever on the urinary organs is attended with risk to the patient.—*British Medical Journal*, *Nov.* 9, 1872, *p.* 517.

56.—THE TREATMENT OF STRICTURE.

By Dr. P. J. Molony, B.A., Waterbeach, Cambridge.

The difficulty in passing a catheter from before backwards, through a stricture, arises from the certainty of the end of the instrument catching in the pouch which surrounds the stricture; or, to use Mr. Jordan's apt simile, its getting under, over, or at the sides of—in fact, outside—the narrow end of the funnel. Now the prevention of this is easily effected by what is generally known as "Hutton's railway catheter," or, rather, by a slight modification thereof. That commonly used consists of a No. 2 flexible catheter, cut off at the eye, and a piece of catgut instead of stylet, which, on the end of the catheter reaching the stricture, is pushed on into the bladder, and then serves as a railway for the catheter to run on. If, instead of a No. 2, we take a No. 10, cut smoothly across at the eye, and pass it down to the stricture, it is evident that its end will go into and fill up the circular pouch, and the centre of the stricture will project into the catheter

somewhat like the os uteri into a vagina speculum. The next thing to be done is to inject a small quantity of oil into this tunnel, and then proceed to use the smaller instrument determined on, which may be a piece of catgut, a filiform bougie, or a No. 1 catheter. By the above method I lately succeeded in a case when I had almost given up hopes; and I believe it may be of use in some other difficult cases, so I think it right to ask for it a trial.—*British Medical Journal, Nov.* 30, 1872, *p.* 605.

57.—ON RETENTION OF URINE.

By Dr. George H. B. Macleod, F.R.S.E., Professor of Surgery, University of Glasgow; Surgeon and Lecturer on Clinical Surgery, Royal Infirmary.

We receive a large number of these very troublesome cases. As a rule, the retention is due to organic stricture, but not a few patients present themselves in whom the retention arises from the congestion which so often follows a fit of intemperance. There are few affections in which one has more frequently to deplore incautious and rash interference, than those of retention, from whatever cause arising. Very few cases come into the hospital that have not been seriously injured by the careless or ignorant employment of instruments; and, in the great majority of these cases—those of organic stricture and enlarged prostate—relief is obtained, after admission, without having recourse to instruments at all. The rule in my wards is to give these patients a warm bath, and to inject subcutaneously $\frac{1}{8}$th gr. of acetate of morphia, when they are in the bath. If this fail, they get a full dose of castor oil and tincture of opium, followed by another hot bath, and if that fails I am sent for. I can easily recall the few cases, out of the large number admitted, in which I have been forced to employ the catheter to relieve pressing symptoms, and in no case since I entered the hospital, has it been necessary for me to puncture the bladder. Chloroform is of inestimable service in the management of such cases. Twice within six months I have been able to fulfil two objects—to relieve the bladder and cure the stricture—when compelled to use instruments in retention, and it was as bearing on that circumstance, that the foregoing remarks were made. Having failed in one case of very close organic stricture, with much laceration of the canal, to introduce a catheter, I passed, with little difficulty, Holt's dilator, which, from its shape and construction, is very well fitted to pass a tight contraction, and thus I was able to split up the stricture at the same time that I relieved the bladder. This I have subsequently repeated in a similar case, with

equally good effects; and, as such a use of Holt highly commended itself to me as a ready and effectual way of "killing two birds with one stone," I thought it worth while to relate it. I may add that it were well if the profession without the walls of the hospital would exercise more caution, and use less force in dealing with cases of retention.—*Glasgow Medical Journal, May* 1872, *p.* 329.

58.—A CASE OF IMPASSABLE STRICTURE OF THE URETHRA SUCCESSFULLY TREATED BY LEECHING AND GRADUAL DILATATION.

By W. F. Teevan, Esq., Surgeon to the West London and St. Peter's Hospitals.

W. C., labourer, aged 45, was admitted into the West London Hospital on November 10, 1871, for retention of urine. The house-surgeon, Mr. Hill, was unable to pass any instrument, but relieved the patient with a hot bath and an injection of laudanum into the rectum.

Past History. Twenty-five years ago he caught a gonorrhœa, which degenerated into a gleet, lasting for one year. The complaint was treated with medicines only. Twenty years ago he began to suffer from an increased frequency of micturition, and the size of the stream gradually got smaller; eight years ago he got his first attack of retention, for which he called in a surgeon, who could not, however, pass any instrument, but relieved him with a hot bath and some physic. A few years ago the patient paid three visits to a hospital, but no instrument could be passed through the stricture.

Present Condition. The patient is an active man, of thin wiry frame, and does not look much amiss. States that he is incapacitated from following his work, as he wants to urinate every ten minutes during the day and every hour in the night.

November 11. To-day Mr. Teevan tried, without success, for half an hour to pass various instruments. On the 15th, 18th, and 22nd he repeated his efforts, but with no result. The stricture was ascertained to be a long tunnel one in the subpubic region.

25th. To-day six leeches were applied to the perineum, which bled freely for some time.

29th. Mr. Teevan succeeded in passing the smallest silver catheter into the bladder, and drew off some urine. The instrument was withdrawn in a quarter of an hour, as it caused considerable irritation.

December 2. No catheter could be got into the bladder to-day.

6th. 2 p.m.: Six leeches were put on the perineum, and at 4 p.m. the catheter was successfully passed into the bladder and allowed to remain for half an hour. The patient was unable to bear it in for a longer period.

On December 9, No. $\frac{1}{2}$ silver catheter passed; December 13, Nos. 6 and 7 (French gauge) elastic olivary bougies were successively passed and left in for a few minutes; on December 16, No. 8; and on December 21, Nos. 9 and 10 olivary bougies were introduced.

The patient left the Hospital on December 23, but came again on December 30, when only No. 9 could be introduced. He states, however, that he can pass a fair stream, and holds his water for several hours.

On January 3, 1872, Nos. 9 and 10 passed, and on January 6 Nos. 11, 12, and 13. Patient has resumed work. Can hold his water for five hours with perfect comfort. Is only twice troubled at night.

On January 10, No. 14; January 13, No. 15; January 17, No. 16; January 20, No. 17; January 24, No. 18; January 27, No. 19; February 3, No. 20; February 20, No. 21.

Mr. Teevan remarked that there were several points of interest in this case. The first thing to be noticed was that the patient had never used an injection for his gonorrhœa. There was still a lingering belief amongst some surgeons, and particularly the public, that injections might cause a stricture; but his experience told him that injections never caused stricture, unless, indeed, they were of great strength. If 100 patients be examined regarding the way their gonorrhœas had been treated, it would be found that only about half had ever used injections, thus clearly proving that the objection to their use was not founded on any facts. A strong injection, however, might cause stricture, as he recently had had two gentlemen under his care for stricture of the urethra in whom the complaint had apparently been caused by the application of a strong solution of caustic for spermatorrhœa. Mr. Teevan observed that four surgeons, including himself, had utterly failed, after long and renewed efforts, to pass any instrument, and it was not until he freely leeched the perineum that he was able to introduce a catheter, although the patient had been placed in the most favourable circumstances for catheterism, as he had been kept quiet in bed for a fortnight, and freely purged. It was therefore perfectly clear that all the good in this case had been achieved by the leeching. Now, this useful auxiliary was but little employed in England, on account of the public prejudice against the abstraction of blood; but it was capable of affording great relief in the treatment of retention and impassable strictures; and he would wish to confirm the remark of M.

Boret, of Tamboff, to the effect that the administration of chloroform was useless in the treatment of retention or stricture, for if an experienced hand could not introduce an instrument, the administration of chloroform would not enable him, as it does not reduce bulk; whereas leeching and bleeding are most useful, as they lessen quantity and increase the capacity of the constricted urethra by withdrawing blood from the vessels in and around the tube. Mr. Teevan, in conclusion, stated that this was the only case in which he had ever succeeded in passing a silver catheter after failing to effect the desired object with filiform or whalebone bougies.—*Med. Times and Gazette, Feb.* 8, 1873, *p.* 141.

59.—ON THE SELECTION OF POSITIONS FOR CATHETERISM.

By W. F. Teevan, Esq., B.A., Surgeon to the West London and St. Peter's Hospitals.

The position to be adopted when an instrument is required to be passed must be considered in its twofold aspect, as affecting patient and surgeon.

I think it may be said that in this country it is usual for the manipulator to stand by the side of the patient, whom he has placed in the recumbent posture; and it is not difficult to discover the reason of the custom, for, as metal instruments have usually been employed, it followed as a matter of course that the patient was forced into the recumbent position, as the only one in which he could have endured the pain and annoyance resulting from prolonged catheterism. The surgeon who is about to pass an instrument is similarly situated to a captain steering his vessel into harbour through a tortuous channel, and a very cursory view of the course pursued by the latter will show that there is much to be gained from noticing the position adopted by the captain. The first thing that strikes us is that the captain so places himself that his body, axis of vision, vessel, and the point to which he is steering, are all in the same median plane. Now he derives the greatest possible advantage from this method, and in fact places himself in the most favourable position for accuracy. The late Professor De Morgan stated in one of his lectures that there were but few men who could shut their eyes and then picture to themselves three separate and distinct lights, and that, as a rule, the majority of men could only imagine two points clearly apart; for if they tried to picture more the images became indistinct, confused, and quickly merged into one or two. Therefore the fewer the points we have to carry in our mind's eye, the easier

will it be. In everyday life we see men instinctively carrying this out, and whether we observe the captain, engine-driver, or rider or driver, we see them one and all reducing the points to the fewest possible, and putting them all in the same median plane. The surgeon, however, who stands by his patient to guide a catheter into the bladder dislocates his points, if I may use the expression, and places himself in the most unfavourable position for success. I would, therefore, premise my observations by saying that whatever positions be selected they ought all to lie in the same median plane, and I feel sure that a very short trial of the comparative merits of both methods will convince the operator that it is much easier to steer a catheter into the bladder when all the points are in the same median plane, than when he has dislocated one or more of them, by placing himself at an angle to the path along which he has to guide his instrument. The position for the surgeon ought to be selected before that for the patient, inasmuch as the first is the active agent in the operation—he has to do something, often very difficult, and he ought to be permitted to choose that position in which he will be most likely to attain success. The surgeon is the active agent, the patient the passive; the former ought to have the greatest freedom of motion, the latter had better have none at all, the more fixed he becomes the better. Let there be the greatest amount of mobility in the instrument, but none at all at the gateway. Now, there are three positions open to the surgeon: he can stand, or sit, or kneel down. We may dismiss the last from discussion, as it can only be required in some very exceptional cases. The standing position, which is the one usually followed in this country, has four great disadvantages attached to it: it is the most fatiguing; it is the one in which the operator will find his delicacy of touch impaired if the manipulations be prolonged; it is the one in which the surgeon is most likely to lose his temper or become impatient; and, lastly, it is the most favourable position for making a false passage. I consider the last objection to be the most serious, for false passages, when met with, are nearly always to be found in the lower wall of the urethra, and they occur there because the surgeon, when standing, has enormous power, and as he bends over the patient he bears heavily on the instrument, and unwittingly forces it into the part of the canal I have mentioned. Now, the sitting position is absolutely free from all these objections. However prolonged the operation may be, the surgeon will not become fatigued, and, as a matter of course, he will not run the chance of losing his temper or his patience. But the sitting position has special advantages attached to it; it is the one in which he possesses the greatest freedom for imprinting any direction he may

desire on his instrument, and, happily, it is the one in which he enjoys the maximum amount of mobility with the minimum of power, and is, therefore, the one position in which he is the least likely to make a false passage. Then, again, when the surgeon sits, and the patient stands, the urethra, instrument, and direction of force exercised by the operator, may all be regarded as in the same horizontal plane, and so placed that he is enabled to carry in his mind's eye a central axis round which he can work, as from a centre, and so examine every point on the face of the stricture when searching for the entrance. If the surgeon adopts the sitting position, I feel convinced that he will in the long run prove a far more successful operator than one who stands, and that he will often succeed where the latter has failed.

Now for the patient's position. He is, as I have mentioned, usually placed on his back, with his shoulders supported and knees drawn up. This position possesses but one advantage, and that is, the patient is less likely to faint than in any other. On the other hand, there is a very serious disadvantage attached both to it and the sitting posture, and that is that they are neither in the same horizontal or vertical plane as the instrument and direction of force, when the surgeon is seated. There is a special objection to the sitting posture for the patient, inasmuch as, if the bladder be distended, or the prostate enlarged, there will be a great alteration effected in the relation of the neck of the bladder to the axis of the urethra; and I have often demonstrated on the living body that catheterism, when impossible in the sitting position, becomes perfectly easy if the patient be extended to his full length. I have, at p. 533, vol. i., of the Lancet for 1871, stated that nearly all strictures are situated at the triangular ligament, and I have there explained the reason. Now I am not aware that there is any evidence to show that the urethral opening in the triangular ligament can be in any way altered by change of position; but it may certainly be said that it is far more difficult to introduce an instrument into a stricture if its mouth be flaccid and mobile. What we desire is fixity, and we shall best achieve this object by placing the patient upright against the wall and stretching his penis horizontally forwards. So situated, we have at last attained all that can be desired; for the urethra, instrument, and direction of force are all in the same horizontal and vertical plane, and our axis of vision will nearly correspond. Thus, therefore, we shall be able to impress on the point of the catheter, when lost to view, any direction we may desire it to seek, and our operation will no longer be an exhibition of blind and unguided force, but a successful demonstration of applied skill.—*Lancet, Feb.* 15, 1873, *p.* 235.

60.—RENAL CALCULUS, GRAVEL, GOUT, AND GOUTY DEPOSITS, AND THE VALUE OF LITHIUM SALTS IN THEIR TREATMENT.

By Dr. A. B. Garrod, F.R.S., Physician to King's College Hospital.

Value of Lithium Salts in certain forms of Urinary Gravel and Calculus.—It is in the treatment of that form of gravel and calculus into which uric (lithic) acid enters as an important element that the salts of lithium are most advantageously employed; but even in other forms it is to some extent useful. Lithium salts, as has been remarked above, possess powerful diuretic properties, and it is a great point in almost every form of gravel to increase the amount of the urinary secretion, for by this means all the substances liable to be deposited from the urine in the pelvis of the kidneys and in the bladder are rendered more soluble, and this remark applies more especially to uric acid and urates; and if the lithium salts are more powerfully diuretic than the corresponding salts of potassium and sodium, it follows that they must act more powerfully as lithontriptics. When administered in cases of uric gravel and calculi their value is the more evident, seeing that the lithate or urate of lithium is so much more soluble than the urate of potassium, and still more so than the urate of sodium. The amount of a lithium salt required to keep the urine neutral, and to hold the uric acid in solution, is much smaller than that of the corresponding salt either of potassium or sodium.

I could give many illustrations of the value of lithium salts in these cases; a few will prove sufficient. A gentleman about 60 years of age was passing at the time he came under my care numerous uric acid calculi—in fact, scarcely a day elapsed without some being seen; besides which, he had previously been operated on for stone in the bladder. He was ordered about five grains of carbonate of lithium twice a day in the form of lithia water, which consists of the carbonate dissolved in water by means of an excess of carbonic anhydride (carbonic acid gas). From the time of commencing this treatment he ceased to pass calculi, the urine remained clear, and his health in all respects improved. I had an opportunity of seeing this patient after he had followed this plan for seven years, and he considered that he had been cured by it, not only as regards the calculi, but in other respects, which will be alluded to afterwards.

Another gentleman, 58 years of age, possessing an hereditary tendency to gravel and gout on the mother's side, was suffering when first seen from great uneasiness in the left loin, the frequent passing of red sand in Cayenne-pepper like grains,

and from retraction of the left testicle, &c. The granular effervescing citrate of lithium (a somewhat doubtful preparation) was first given with some advantage, about 60 grains twice a-day; still crystals of uric acid were frequently seen in the urine and some uneasiness felt. Afterwards lemonade was ordered—a pint and a half each day, containing 120 grains of citrate of potassium and 20 grains of citrate of lithium. Under this treatment the patient lost the pain in the side; the urine became greatly augmented in quantity. On five days during the first week of following this plan the quantity was 65, 55, 55, 60, 85 fluid ounces; scarcely any sand was visible, and this probably from the washing-out of old crystals from the kidneys; the specific gravity on one occasion 1023. The saline was then increased by one-half, and the urine taken on three occasions was about 80 fluid ounces; the specific gravity was 1025, 1020, and 1020. The urine was very clear and without sand, and the patient remained free from pain or uneasiness. On omitting the saline the urine became gradually less in quantity, and of higher specific gravity—about 1028—with occasional sand, and pain in the side. On recommencing the above plan the specific gravity was lowered to 1020, and on again omitting the saline it rose to 1030, the patient at the same time exhibiting some of the old symptoms.

It was the opinion of the patient that the large doses of the citrate lowered the tone of the system, and it was then proposed to try the lithia salt alone; 15 grains of neutral citrate of lithium were given three times a day; the specific gravity of the urine was lowered to 1020. When only two doses were taken the urine remained at 1024, and quite free from sand, and not the least feeling of lowering was experienced.

Numerous trials made with salts of lithium and potassium separately led to the following conclusion—namely, that by means of from 20 to 30 grains of citrate of lithium the urine can be kept as full in quantity, the specific gravity as low, and the freedom from sand as great, as from the use of from 120 to 180 grains of citrate of potassium; and that when under the influence of the lithium salt no debility is experienced, whereas the lowering is often well marked when the citrate of potassium is exhibited.

I may quote a third case—that of a lady who had long suffered from pain in the left loin, with frequent passage of small quantities of blood and abundance of uric acid. In this case by the long-continued use of lithium the urine was kept free from gravel and blood, the pain in the side removed, and the general health very greatly improved.

In my case-books there are records of numerous cases illustrating the above statements, and which prove beyond doubt

that lithium salts given even in moderate doses are most effectual in preventing the occurrence of uric acid or urate gravel, and likewise the formation of uric calculi; and the only objection to their more extended use lies in the high price of these salts compared with that of potassium and sodium, which does not apply in any marked degree to a large class of patients who suffer from these affections.

2. *Value of Lithium Salts in the Treatment of Gout, and for the Removal of the so-called Chalk-Stones or Gouty Deposits.*—It can be shown beyond all doubt that in cases of true gout uric acid, in the form of urate of sodium, is always present in the blood; it can also be easily demonstrated that when gouty inflammation occurs in any tissue, as in the cartilages of the joints, or the ligaments surrounding the joints, urate of sodium becomes deposited in them; and that frequently this salt, in the form of chalk-like deposits, becomes visible externally, sometimes in the fibro-cartilages of the ears, or around the smaller or even larger joints, at the ends of fingers, and in other situations; and lastly, the kidneys are frequently found with numerous streaks of such urate deposits between their tubuli—deposits which have ensued as an accompaniment of gouty inflammation in those organs. This being the case, it would naturally be supposed that lithium salts might prove of advantage in the treatment of both acute and chronic forms of gouty inflammation, and likewise, when administered in the intervals of the attacks, might keep up such a state of the blood as to prevent the occurrence of such inflammatory action.

(a) Lithium Salts as Internal Remedies in Acute and Chronic Gout.—In gouty inflammation my own experience would lead me to the conclusion that lithium salts possess all the virtues of those of potassium and sodium in an exalted degree, increasing the amount of the urine, and rendering it less acid and free from deposits; but it must be known to all who have been engaged in strict therapeutic inquiries that the difficulty of determining clinically the true value of any remedy in such cases is exceedingly great. At the same time, our knowledge of the high diuretic power of lithium salts, their great alkalinising and solvent powers for uric acid, at once render it probable that their value must be great. In chronic forms of the disease, and in the intervals between the attacks, their value is more readily shown. In the first case above referred to this was well marked; the patient, before he commenced the use of the lithium, was accustomed to be laid up with attacks of gout about twice in the year, but during the seven years in which he was under lithia treatment he was free from gout as well as calculi. Numerous patients have informed me of a similar result having followed a similar plan of treatment. I do not

for a moment intend to assert that other means may not, in many cases, be resorted to with advantage, but only that the salts of lithium are very advantageous, given either alone or in conjunction with other remedies. It is a matter of interest, before completing this part of our inquiry, to ascertain if the lithium salts produce any physiological symptoms other than those we have already alluded to; this we will now endeavour to determine.

From an extensive experience in their administration, I may state that in the doses which I have commonly given—namely, about ten to fifteen grains of the carbonate and twenty to thirty grains of the citrate—I have scarcely ever seen evidences of any action otherwise than on the secretion of the kidneys and the condition of the urine; there are, however, well-observed facts which appear to show that some influence on the nervous system is occasionally produced. I have seen two or three cases in which a little tremor of the arms appeared to be induced, but in one of these patients there was a tendency to the symptom even when the drug was not administered. I have been informed that similar symptoms have been noticed by others, but as yet I have neither seen nor heard of any serious effects being induced by their exhibition. It would be interesting to ascertain the physiological effects of larger doses of the lithium salts than those commonly given at the present time. As to the choice of the lithium salts as internal remedies, this must depend on circumstances; it must be remembered that if the carbonate is given it acts as an antacid to the stomach, and increases the alkalinity of the blood, and appears as an alkaline carbonate in the urine; it therefore acts both as a direct and indirect antacid. When a lithium salt with a vegetable acid is substituted for the carbonate, it exerts no antacid property upon the alimentary canal, but appears in the urine as carbonate; hence it may be regarded as a remote, but not as a direct, antacid. Where the change takes place—whether in the blood itself or in the kidneys—we have as yet no data by which to determine the fact; although its determination is by no means without importance, for on it depends the question of the equal efficacy of the citrate and carbonate when the object is to produce an alkaline effect upon the blood. It is usually assumed, and with considerable probability, that the change takes place in the blood itself—that the vegetable acid becomes oxidised in that fluid, or burnt off; and if such be the case, there is often considerable advantage in substituting a citrate or acetate for a carbonate, as the alkaline reaction upon the alimentary canal is often undesirable, especially when the treatment is continued for any length of time. These remarks apply, of course, to all the alkaline salts,

and are by no means confined to those of lithium. Of this we may feel sure—that if an alkaline action on the urine is required, a citrate or acetate is equal to a carbonate, provided no aperient effect is produced; that when it is our object to produce an alkaline effect on the stomach, the carbonate must be administered; but that at present it is a little doubtful whether the blood is equally affected by a citrate and carbonate.—*Medical Times and Gazette, March* 8, 1873, *p.* 246.

DISEASES OF THE EYE.

61.—ON CONJUNCTIVAL TRANSPLANTATION FROM THE RABBIT.

By Dr. J. R. Wolfe, Surgeon to the Glasgow Ophthalmic Institution; Lecturer on Ophthalmic Medicine and Surgery in Anderson's University.

[Experiments made upon animals by Dr. Wolfe prove, contrary to the current opinion, that the ordinary secretion of tears for lubricating the eyeball is derived from the conjunctiva, and is not formed in larger quantity than can be got rid of by evaporation.]

When both the conjunctiva of the eyeball and the corresponding palpebral conjunctiva are destroyed by a burn with hot metal, gunpowder explosion, quicklime, or other chemical substances, adhesion or symblepharon is the result. Iron-moulders, puddlers, and labourers in chemical works being most exposed to such accidents, hence cases of symblepharon are numerous in Glasgow. This patient, a foundry boy from Airdrie, came to the institution two days ago for the relief of symblepharon. You see the lower eyelid fixed to the eyeball covering very nearly the whole cornea, the eyeball completely tied down, for even the levator palpebræ, instead of lifting the upper eyelid drags the eyeball and imparts to it an awkward rotatory motion. Vision is completely abolished. This case is highly unfavourable to operative interference.

To cure symblepharon is generally admitted to be exceedingly difficult, if not impossible. Numerous are the expedients which have been resorted to for the cure of that affection. They have all for their object the mechanical separation of the lid and eyeball until the raw surfaces cicatrize. Some operators try to effect this by simply dissecting the adherent lid, and then tearing up the wound daily, for a certain period until it no longer united. Others, again, try to keep the surfaces separate by interposing foreign bodies, as sealing-wax, leather, glass shields, &c.

Dieffenbach's method is the most ingenious. He detaches the lid from the eyeball, shaves the lashes, and then folds the eyelid upon itself, so that the skin comes in contact with the eyeball. He fixes it in this position with sutures until it heals.

After repeated trials of these methods I came to the conclusion that the proper operative method was still to be discovered.

(1.) Repeated tearing of the surfaces is useless. We always found that nature frustrated our attempt of the previous day to keep them asunder. I watched the process very carefully, and noticed that union does not take place by exudation of lymph (as taught by the Vienna School), but strictly according to Virchow's theory—viz., by proliferation of the cells, or, if I may use the expression, by parenchymatous agglutination. There is, therefore, no plastic membrane to tear or tease out.

(2.) The interposition of foreign bodies must appear a vain attempt to any one who has ever tried to insert an artificial eye after dissecting an adherent eyelid. The foreign body is in such cases invariably squeezed out by gradual constriction. Indeed, I may say with regard to these and similar methods, that they are based upon the supposition that a delicate physiological action can be replaced by a coarse mechanical contrivance. Nature, which supplies the organism with lymph, synovia, mucin, and tears for smoothing the various membranes, abhors every motion upon rusty hinges or friction of surfaces. Whenever these surfaces rub upon each other they ultimately adhere.

For the last few years I have practised an operation for the radical cure of symblepharon by plastic operation of the conjunctiva. I take a portion of the neighbouring healthy conjunctiva of the eyeball, wherever I can get it, to supply the palpebral conjunctiva which has been destroyed. For experience has taught me, that loss of conjunctiva oculi, even to a very large extent, is generally regenerated without prejudice to the neighbouring tissues, whilst loss of the conjunctiva of the eyelid is followed by such disastrous results as pannus, ulcerated cornea, &c., &c., above referred to.

Fig. 1 represents the case of Simon M'K., aged twenty, moulder, who, three years ago, had his eye burnt with molten lead, resulting in adhesions of the lower eyelid, which covered the lower half of the pupil. I dissected carefully the eyelid from the eyeball, separating it as far as the *cul-de-sac*, to make quite sure that I had liberated the eyeball completely. I then passed two fine silk threads through each side of the conjunctiva at the outer aspect, which ligatures marked the breadth of the conjunctival flap to be removed. These two I put on the stretch, and with a pair of scissors I first cut horizontally, and then on each side of the ligatures,

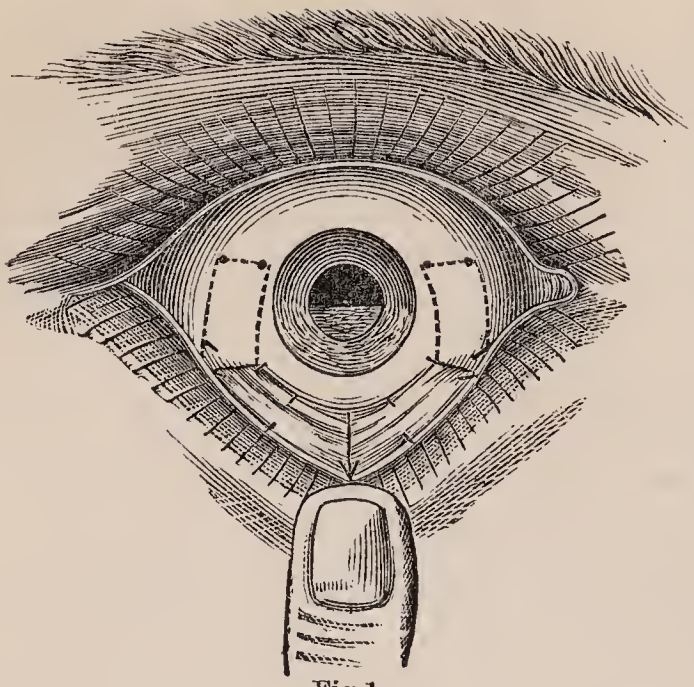


Fig 1.

then putting the scissors behind, I cut it from the eyeball. In cutting the flap on the stretch by means of the ligatures, I take care that the conjunctival flap is removed without any of the sub-conjunctival tissue. The same process is followed at the inner side, and these two flaps are brought together in the middle line, and secured with stitches, as marked in the diagram.

The operation was performed in Sept. 1869, and it will be seen that he has the free movement of the eyeball. There is scarcely any perceptible trace upon the eyeball whence the flaps were borrowed. The cornea only presents some traces of leucoma where the adhesion formerly was, and these latter are also gradually disappearing.

Fig. 2 represents the case of John Muir, age 15, tinsmith, who burnt his eye with strong hydrochloric acid two years ago, resulting in extensive symblepharon. On presenting himself at the Institution in June last, I found the lower eyelid completely covering the upper margin of the pupil; vision was therefore impossible. The first step accordingly was to make an iridectomy upwards and inwards, and in August last we proceeded to the plastic operation of the conjunctiva.

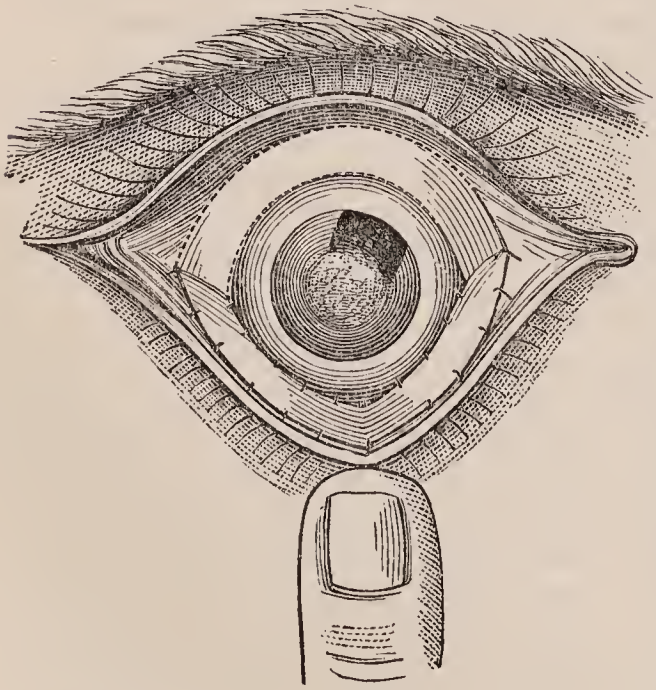


Fig 2.

But it will be seen that the lateral flaps were, in this case, impossible, because the burn extended above the meridian. I therefore took one large flap from the upper hemisphere of the ball, and secured it upon the eyelid as above described.

About three years ago, after I prepared a paper for the press on the subject, I became aware that Mr. P. Teale, of Leeds, published a paper on a similar operation in the Ophthalmic Hospital Reports. Although Mr. Teale's operation differs from my own, yet, such is my repugnance to squabbles about originality and priority, that I did not publish my paper. But having had an opportunity, in August last, to explain to the Ophthalmological Congress the nature of my operation as distinct from that of Mr. Teale, I can have no hesitation in referring to it here. Mr. Teale takes "a flap from each side of the conjunctiva, one is stretched across the raw surface of the eyelid, and the other is fixed across the raw surface of the eyeball—thus the two flaps are dovetailed into the wound." It is thus evident that in this operation a large supply of conjunctival tissue is requisite to repair a comparatively slight injury, while in my operation the conjunctiva of the globe is altogether disregarded; the palpebral conjunctiva alone being repaired. Besides, I take my flap from the whole breadth as far as the cul-de-sac, if necessary. The result is that, while Mr. Teale interferes only with a case of symblepharon, "provided it be of moderate extent," my operation is applicable to extensive adhesions, provided there be sufficient transparent cornea to make an artificial pupil, as shown in figure 2.

This is fully borne out, not only by the drawings in Mr. Teale's paper on the subject, but also by comparing the patients which Mr. Teale brought up to London to show to the Congress with those which I have the pleasure of submitting to the Society this evening.

It is right, however, to bear in mind that there is a limit to the extent to which we may go in borrowing conjunctival substance from an eye which has already been injured. If we surpass that limit, the corneal opacity is sure to extend still further, and we lose the last chance of saving vision. Indeed, we sometimes meet with cases in which the infliction of a new wound amounts to the destruction of the eye. This leads me to speak of the last case which I submit, as it is of peculiar interest:—

Ed. M'In., aged 31, labourer in ironsmelting, Coatbridge, was struck by a ball of red-hot iron in the left eye on the 17th Sept., 1872, which caused the destruction of the lower conjunctiva and the greater part of the cornea. When he first came to the institution on the 24th September, seven days after the accident, the conjunctiva of the lower eyelid was com-

pletely destroyed, and the corresponding conjunctiva of the eyeball—the whole conjunctival sac was in a state of serous chemosis, and the greater part of the cornea burnt. Emollient applications were used. After a week's stay in the institution he was sent home to come back when the swelling had subsided. He returned five weeks ago. On examination, the lower eyelid was found completely covering the cornea above its upper pupillary margin, the eyeball, quite fixed by the upper and lower eyelids, and sunk in the orbit. On lifting the upper eyelid with the finger the sclerotic was seen as it were receding, and no dragging upon the eyeball could turn the upper border of the cornea sufficiently forward and downward even for making an iridectomy. The attempt to take a conjunctival flap from the upper hemisphere of the eye, as done in the previous case, was altogether out of the question, for there was no room to manipulate either with scissors or bistouri. Indeed, it was pretty certain, considering the narrow strip of transparent cornea, that its opacity would certainly have ensued, even if section at its periphery had been practicable.

I was about to give up all idea of surgical interference, when it occurred to me, that I might give the patient some chance by supplying him with conjunctival substance from a rabbit.

I would request the gentlemen present to take a careful view of this patient. You see that both eyes are naturally too deeply set. The upper hemisphere is set too closely behind the roof of the orbit. You will notice therefore, that owing to the natural formation of the parts the portion of the cornea which escaped destruction could not be turned into account. Besides, seeing the narrow strip of transparent cornea left, to have removed a conjunctival flap from its vicinity would have resulted in rendering even it opaque.

Fig. 3 represents the eye before the operation, the upper eyelid being raised to show the portion of the cornea which escaped the burn.

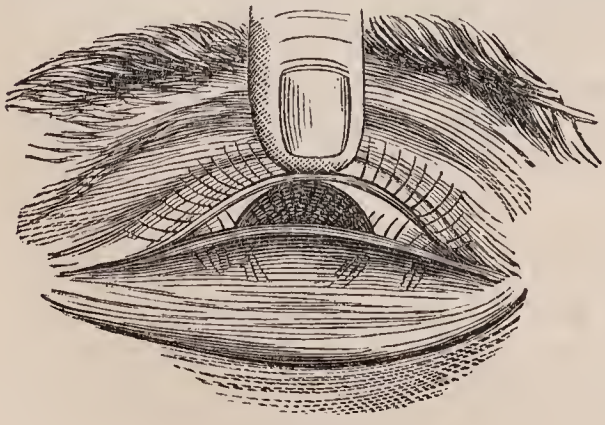


Fig. 3.

The operation was performed on the 3rd Nov., in the following manner:—Both patient and rabbit being put under chloroform, I separated the adhesions, so that the eyeball could move in every direction, and everting the lower eyelid and turning it downwards, I took from the

rabbit that portion of the conjunctiva which lines the inner angle, covering the *membrana nictitans* and extends as far as the cornea, the portion to be removed having being previously defined by four fine silk threads, which enabled me at the same time to transfer it quickly to replace the lost conjunctiva palpebræ of the patient, in which place it was secured with stitches as shown in *Fig.* 4. I take this portion on account of its vascularity and looseness. The eye was covered with a bandage and dry lint.

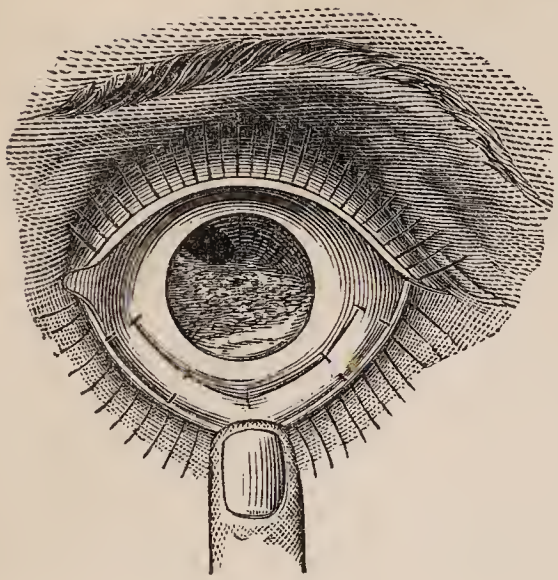


Fig. 4.

Next morning, Nov. 4, the eye was found tolerably quiescent. The whole conjunctival sac was not more inflamed than was to be expected would result from the extensive dissection and from the presence of ligatures. The transplanted conjunctiva had a greyish look. Ordered warm fomentations.

Nov. 5. Complains of great pain and lachrymation, wound more tender. New conjunctiva lost its greyish appearance with the exception of isolated patches here and there, the rest is swollen and glistening, and in some parts looks not unlike exuberant granulations. Ordered warm fomentations, with vin. opii., and belladonna, and strong purgatives.

Nov. 6. Swelling subdued. The grey patches decreased to two in number, and these are very small, about the size of a hemp seed.

Nov. 7. Appearance of the eye improving, irritation subdued. The new conjunctiva red and adherent. I removed the ligatures, after which the eye continued to improve. Patient remained in the hospital for a week, during which time he was carefully noted by me, assistant, and students. The eyelid remained separated through its whole extent, the eyeball moveable in every direction, while the transplanted palpebral conjunctiva retained its vitality, as shown by its red appearance and comparatively smooth surface. There was only one grey spot, the size of a pin's head, visible. Was dismissed on the 11th Nov. He returned three days ago, last Tuesday, Dec. 3. The eye was found in a satisfactory condition. The conjunctiva has a healthy look, the free motion of

eyeball maintained, which enabled me at once to make an artificial pupil, which is also shown in Fig. 4.

Here, then, an eye which had been rendered immoveable and totally blind by disorganization of its conjunctiva, and the greater part of the cornea, and owing to the natural formation of the parts as well as to the extent of the loss of the tissue, even the portion of cornea which escaped could not be turned to account, has, by this new procedure, been rendered a useful organ, the eye being moveable in every direction. He reads No. 16 with the new pupil made three days ago.

Our first attempt in this direction being thus encouraging, I think I am justified in saying that, if further experiments should establish the adoption of this method, we would not only possess a valuable expedient for curing an affection which has hitherto been deemed incurable, but I would consider it as an important step towards a greater surgical achievement, namely, corneal transplantation.

There is a large class of patients in blind asylums and elsewhere whose eye tissues are perfectly healthy, with the exception of corneal opacity. Now, the question is, shall we ever be able to supply them with transparent corneæ by transplantation? All attempts formerly made in that direction have failed on account of the impossibility of measuring the size of the flap. Mr. Power, of St. Bartholomew's Hospital, London, informed me last spring that he was engaged in corneal transplantation from the rabbit. Indeed, in August last, he exhibited to the Ophthalmological Congress a case which was so far successful that the cornea from a rabbit grew upon that of a child, but, unfortunately, it was opaque. Mr. Power informed me of one case, namely, that of a soldier, in which the transplanted cornea kept its transparency for about six weeks. Now, it appears to me in experimenting with these instruments which Mr. Power kindly sent me, that the occasion of its becoming opaque may be partly owing to the isolation of the corneal flap from the neighbouring tissues, for Mr Power's instrument removes a complete corneal circle. Our chance might be improved if we could make a cornea-conjunctival flap. Here is an instrument made for me by Mr. Hilliard, consisting of two revolving lancets, moving within a cylinder, and of two picks to fix the eyeball. The lancets cut the larger segment of a circle, leaving a corneal bridge. From this point the corneal incision is further carried on with a narrow knife, and prolonged to the conjunctiva, the conjunctival portion having previously been prepared by dissection. The conjunctival portion will not only give the cornea a point of attachment, but render it less isolated, and improve its chance of vitality.

The first thing therefore to ascertain, was whether the conjunctiva would live. Seeing now, as this case shows, that conjunctival transplantation is feasable, we have an important point gained.

In answering, therefore, the question put above, I can only say that we are nearer to the point we are aiming at, to-day than we were yesterday.

Since the above went to press, I have had another successful case of conjunctival transplantation from the rabbit, which goes far to confirm the views expressed above, for it is not merely a repetition of the same method, but a new element has been introduced with the view of checking the result obtained on the former occasion.

Peter C., Furnace Quarry, Argyleshire, received an injury upon his face and eyes from a gunpowder explosion when blasting rocks, fourteen months ago. When he first came to the Institution, four months after the accident, his face was quite riddled and discoloured by the powder. Both upper and lower eyelids of the right eye were considerably everted, and the left eye was completely closed and blinded by a symblepharon analogous to fig. 2. I made an iridectomy upwards, which resulted in a little sight when the upper eyelid was raised. On his returning this time to seek further relief, I thought it expedient to resort to our new method. I performed the operation, assisted by Mr. Nairne and Mr. Wm. M. Campbell, as on former occasions, on the 23rd Jan. The conjunctival flap from the rabbit I made larger than was requisite to supply the palpebral conjunctiva. It was fixed with stitches as before, but instead of cutting off the superfluous portion, I left it attached. In examining the case daily, in the presence of the gentlemen above mentioned and our students, that loose portion indicated clearly to us, beyond any possibility of mistake, the vitality of the transplanted portion. Whilst it remained greyish, we could notice the gradual changes which the fixed portion was daily undergoing; and on February 3, nine days after the ligatures were removed, the loose portion was still floating upon the conjunctiva a greyish flap, whilst the fixed part had almost entirely assumed a shining appearance.

During the whole course of treatment the eye was quiescent, there was neither pain nor lachrymation, and I may say that it united by agglutination. Free motion and improved vision have been established; and although this case was not so aggravated as the last, yet it may be regarded as a corroborative instance of the efficacy of the operation.—*Glasgow Medical Journal, Feb.* 7, 1873, *p.* 200.

62.—PRACTICAL REMARKS ON THE TREATMENT OF CATARACT.

By G. Critchett, Esq., Senior Surgeon to the Royal Ophthalmic Hospital.

[The numerous articles published upon cataract, show that opinions as to the best form of operation for cataract are very unsettled.]

The questions upon which the chief differences of opinion exist amongst ophthalmic surgeons have reference chiefly, 1st, to the size, form, and situation of the wound; and, 2ndly, to the performance of an iridectomy.

As regards the size I think it will be generally admitted that in old persons with hard fully-formed cataracts, it should be of sufficient extent to allow the exit of the lens without force. In respect to form, it should be curvilinear, representing a segment of a circle about double the size of the circumference of the cornea. Upon both these points there is probably considerable uniformity of opinion amongst operators. The two next questions, viz., the tissue in which the section should be made, and whether an iridectomy should be performed, involve considerable differences of opinion. As regards the tissue, we have to determine whether the section shall be in the cornea or in the opaque white tissue that constitutes the border land between the cornea and sclerotic (a structure that varies much in extent in different subjects), or whether the two extremities of the wound shall be in the white fibrous tissue, and the central part in the transparent cornea. At first sight this may seem like hair-splitting, but in reality it involves an important principle. Some contend that one of these tissues unites with greater rapidity and certainty than the other, and to determine this, extensive and carefully drawn statistics are required. It is generally acknowledged that the cornea is much more prone to take on suppurative inflammation than the opaque tissue, and that "cæteris paribus" a wound of this latter heals better than in the cornea. As a proof of this we may appeal to the ordinary operation of iridectomy, which, so far as the operation is concerned, enjoys a remarkable immunity from risk, large statistics showing a loss of not more than one in five hundred cases. A similar wound inflicted on the cornea would give far less favourable results. The fair inference from this would seem to be that if we could limit the section exactly to this opaque tissue, making it of such a form and size as would permit of the free exit of the cataract, we should obtain more favourable results than in a corneal wound, and I am disposed to think this is correct; but there are certain risks in this

operation that it is well to consider. They are chiefly three—1st. Greater liability to escape of vitreous humour; 2nd. Proneness to secondary iritis; and 3rd. *Possibility* of sympathetic ophthalmia. The reason of the first of these accidents is usually some spasm and pressure at the moment of the exit of the lens, or a long residence of the cataract in the eye, involving toughness and opacity of the capsule, atrophy of the ciliary ligament, and a fluid state of the vitreous humour. Secondary iritis usually depends upon some bruising of its tissue at the moment of exit, or some fragments remaining in the pupillary area, or a constitutional proneness to fibrous inflammation after wounds, aggravated by entanglement of the cut angle of the iris in the wound. Sympathetic ophthalmia (fortunately an exceedingly rare occurrence) is probably due to an encroachment of the section upon the ciliary nerves, and a consequent bruising of that highly sensitive tissue, during the transit of the hard cataract. All three contingencies may be usually avoided when they are fully recognised—the chief source of danger being not so much the seat of the wound as *the point of puncture and counter-puncture;* these being very liable without care to encroach upon the ciliary region. In order to avoid this, a greater curve may be given to the wound, so as to make it represent a larger segment of rather a smaller circle, in such a manner that the puncture, the counter-puncture, and the remainder of the wound are in the opaque tissue close to the cornea, and at a safe distance from the ciliary ligament, exactly in the situation where iridectomy is performed. It may be argued that in this way we are departing too much from the curvilinear and returning to the semi-circular form of section, but although this may be in some measure true, it is unimportant when combined with iridectomy, and when situated in this opaque fibrous tissue, in which the edges keep well together and are generally aided by a conjunctival flap. I believe that in a majority of cases this method of operating, if carefully carried out in all its details, will give the best results, and has many advantages over a corneal operation. Under the most favourable circumstances, however, the warmest advocates of this method must admit, as an inevitable result, the permanent mutilation of the eye by the loss of a portion of the iris, the frequent occurrence of opaque capsule, and a certain amount of irregular astigmatism. In stating the case for curvilinear extraction with iridectomy, as finally bequeathed to us by Von Graefe, and in advocating its advantages I have only claimed for it a majority of average cases, and I should entirely fail in carrying out the objects of this paper were I not to put in a plea for the corneal section.

There are many who prefer the operation of Graefe with the

modification of a corneal instead of an opaque fibrous section, limiting the fibrous part to the puncture and counter-puncture. Time and large experience can alone determine this point. It seems to me that such an operation retains the objections and misses some of the advantages of the Graefe method. If the puncture and counter-puncture are beyond the limits of the cornea, the danger is not increased by making the remainder of the wound in the same tissue, so long as it be not permitted to encroach upon the limits of the ciliary region. If, therefore, it be determined to adopt the corneal section, it seems to me that the operation described by M. Warlomont offers strong arguments in its favour. The section is curvilinear, it is made entirely in the corneal tissue by means of the needle knife, it is nearly painless, and may be performed without the use of an anæsthetic; it is comparatively easy of execution; it does but very little violence to the eye; it is seldom attended with prolapse or synechia; and if it quite succeed, leaves the eye with a circular small pupil, an almost invisible cicatrix, and good optical conditions. Secondary capsular opacity is rare. I should advise this method of operating to be preferred in every case to the old flap operation, which I think should now be altogether abandoned. It seems to be indicated in the following cases—1st. Wherever the modified linear extraction has failed in one eye; 2nd. Wherever both eyes are operated upon at the same time one should be treated by this method; 3rd. Whenever the patient is unable or unwilling to take chloroform; 4th. In persons but little past middle age, in whom the cosmetic result is important, and where it is desirable to obtain the highest optical effect; 5th. Where the cataract is not quite mature, and likely to be sticky, or to leave fragments behind; 6th. In cases where distance renders a secondary operation for the division of capsule difficult or even impossible; 7th. Where the anterior chamber is small and the circumference of the iris is close to the cornea so as to preclude a satisfactory curvilinear section through the opaque tissue between cornea and sclerotic. The objections and sources of danger in this method are the same in kind though not in degree as the old flap operation. There is—1st. The risk of suppuration of the cornea or even of the globe; 2nd. Prolapse of the iris, though in consequence of the curvilinear form of the wound this is of necessity small and easily dealt with, and not incompatible with very fair vision; 3rd. There is anterior synechia—the iris may fall forward and attach itself to the edges of the corneal wound. This, of course, mars the perfection of the eye, but leaves a clear pupil and a good optical result. Whilst I am far from believing that this operation will ever supersede the one known as that of Von Graefe, it commends itself strongly in

those cases indicated above, and, if judiciously selected, will diminish our average of failures.—*Medical Press and Circular, Dec.* 18, 1873, *p.* 517.

63.—THE REMOVAL OF CATARACT BY SOLUTION, ESPECIALLY WITH REGARD TO THE SOFT CATARACT OF EARLY LIFE, AND THE OPERATION BY KERATONYXIS.

By Dr. Archibald Hamilton Jacob, Chief Surgeon to the Dublin Eye and Ear Infirmary; late Ophthalmic Surgeon to the City of Dublin Hospital.

The operation for Keratonyxis, or the breaking up of the cataract with a needle passed through the cornea, was one with which Dr. Arthur Jacob's name and practice were intimately associated, and the result of his very lengthened experience was, that he applied the process to almost all forms of cataract —even those to which it would be now considered inapplicable —and attained great success in its use. In the year 1827 he published his first communication on the subject (Dublin Hospital Reports, vol. iv., page 214), and he followed up the subject by a contribution to the Medical Press in the year 1850, and the strength of his views, founded on the experience of these twenty-three years, may be best appreciated from the following quotation of the last words of this communication. Having cited the result of a number of his operations, Dr. Jacob said:—

"From these cases the surgeon can form some opinion as to the practical results of the operation. They present the general effects of the practice, and certainly do not afford more favourable examples than an everage would supply. I have no wish to indulge in any exaggeration respecting the success of this method. I am writing for surgeons who will, in the sequel, pronounce a verdict upon it from their own experience, and thereby verify or disprove my statements. . . . . I refrain from performing the operation for extraction, only because it is in its nature a most formidable operation, and in its results a most hazardous one. In principle, too, it is not creditable to surgery. To cut open a man's eye in order to squeeze out his crystalline lens through the incision, when that lens can be removed by absorption, I hold to be contrary to the rule which binds the surgeon to give his patient the best chance of recovery, regardless of present inconvenience or delay. But, whatever view may be entertained on this subject, I am firmly convinced that the operation of extraction should be restricted to hard cataracts in aged persons. Under fifty years of age, the

crystalline lens once broken in pieces must be sooner or later dissolved and absorbed. There can be no question as to the result; it is only a question of time."

Heterodox as these views may appear to modern ophthalmologists, I do not hesitate a quarter of a century after their enunciation, to declare my adhesion to their principle, and my entire concurrence in the justice of the comparison which Dr. Jacob then drew between the operations for extraction and solution. In the majority of cases I myself operate by extraction, with the feeling that my doing so is a concession to the convenience of the patient, and that I thereby purchase a comparatively rapid restoration of sight at the expense of a very grave risk of failure, and a certain inevitable sacrifice as regards the ultimate result. I am perfectly persuaded that in *all* cases, excepting those of hard amber cataract of old age, it would be my duty to advise the operation of solution in preference to that of extraction, if the patient were content or able to wait for the result. I do not consider that, since Dr. Arthur Jacob penned these observations, any of the infinite modifications of the extraction operation have very materially improved its safety or efficiency, or have brought it at all into competition with keratonyxis in these qualities, and I, therefore, hold that spoon operations or other procedures recommended for the immediate removal of soft, rapidly-dissolving cataracts, are, unless under very exceptional circumstances, as unjustifiable as they are usually unsatisfactory. In thus expressing my very strong predilection for the operation by solution, I hope I shall not be understood as unqualifiedly condemning the extraction operation, which I have no hesitation in performing very frequently, and in which I think I have a fair measure of success. I desire only to imply that the supremacy of that procedure is the result, not of its surgical perfection or satisfactory effect, but of its greater adaptability to the convenience of the patient. Very many people must be content to incur risk and prejudice results for the sake of their own private reasons, and in such case the operation must be and is performed with usually the best effect. But, in my opinion, no ophthalmic surgeon would be justified in advising extraction until he had satisfied himself that solution was, from the unsuitability of the case or the necessity for haste, out of the question, and the temptation to a brilliant operation or the desire to satisfy the fidgetiness of the patient ought not to deprive the alternative operation of its due consideration.

I have stated that "in the majority of cases I operate by extraction, with the feeling that my doing so is a concession to the convenience of the patient, and that I thereby purchase a comparatively rapid restoration of sight at the expense of a

very grave risk of failure, and a certain inevitable sacrifice as regards the ultimate result. I am perfectly persuaded that in almost *all* cases of true cataract, hardly even excepting those of hard amber cataract of old age, it would be my duty to advise the operation of solution in preference to that of extraction, if the patient were content or able to wait for the result."

In making this exception, however, I do so, not because a hard senile cataract is incapable of being resolved by the operation of division, but because the lengthened period which is required for complete solution goes somewhat to justify the more riskful operation of extraction. Cases of hard amber cataract may present themselves, in which an excision operation is not admissible, in consequence of some constitutional fault in the patient, or in which the patient is content to wait for the result rather than encounter the risks of the extraction operation, and it should be remembered that in such cases restoration of sight is quite feasible if the patient will wait some months for the result. About three years ago an old lady of seventy-four consulted me as to the removal of her cataracts, which were of the usual dark-coloured waxy type, and fully developed in one eye. She was the victim of constant and prolonged attacks of bilious vomiting, which it did not appear could be controlled, and was, moreover, in such a state of health that confinement to bed, or prolonged suffering, might probably be attended with much risk to life. I advised her that none of the speedy methods of removing her cataract were available in her case, but gave her the alternative of an operation for division, assuring her that most probably she would be no worse a week after the operation than she had been before, and that she might confidently hope for restoration of vision within a year. I operated on that lady's lenses, which were as hard and waxy as I ever met, and after three repetitions of the operation, none of which were attended with any ill effect whatever, she was rewarded by a perfect recovery, and she now sees perfectly well. Late writers have expressed themselves as if they held the opinion that not only was the absorption of a hard senile cataract tedious, and, on that account, the division operation inapplicable, but that such a method of treatment was totally out of the question in old persons. I desire, if possible, to remove this misconception. I have seen in my father's practice many, and, in my own, a few hard amber cataracts removed without risk or discomfort, by one or two insignificant operations.

The extreme slowness of absorption, and the necessity for repeated disturbance of the eye in a person advanced in life are, however, sources of inconvenience and risk which justify the selection, as a rule, of the more hazardous operation in cases

of hard senile cataract, and I quote the foregoing case to show that under exceptional and even very unfavourable circumstances, the cataract of old age may be removed by division, and will dissolve even after a single breaking up, if abundance of time be allowed for the process.

There are several forms of capsular or lenticular disease which are included under the name of cataract which are not amenable to the absorptive treatment, and cannot, therefore, be included in the favourable opinion of that method to which I have given expression. These are :—1. The calcareous or osseous cataract; 2. The pyramidal; 3. Extensive capsular opacities; and 4. The false or cheesy cataract which arises from the deposit of products of inflammation upon the surface of the capsule or within the pupil.

If, indeed, the capsule be to a considerable extent involved in the disease, or if it is adherent to the iris to such extent as to make it a matter of difficulty to detach it and displace it from the field of vision, it is probable that a subsequent operation may be necessary for its removal. In a former communication I have described the necessary procedure for that purpose, which, if it cannot be dispensed with, is neither difficult nor dangerous; whilst if the capsular opacity be slight, there will be no difficulty in getting rid of it by displacing it with the needle during the operation of division. The calcareous, or, as sometimes described, the osseous cataract, is a not infrequent result of chronic degenerative inflammation, and is formed by the deposition of calcareous matter on the exterior of the capsule, sometimes of both the anterior and posterior surfaces. Rarely also the tendency to true osseous deposits which results in the laying down of bony plates on the surface of the choroid, is said to determine similar formations in the lens. I have recently extracted a calcareous mass formed of an anterior and posterior plate corresponding to the front and back capsular surfaces, and connected by a network of calcareous trabeculæ, the interstices of which were filled up with softened lens matter.

A lens which has undergone calcareous degeneration can obviously be disposed of neither by division nor displacement, not being susceptible of absorption in the one case, and from its weight and irregular form, very unsuitable for depression or to be permitted to remain as a foreign body within the fundus. Being the product of chronic deteriorative inflammation, it is usually accompanied with a fluid vitreous humour and other sequelæ, such as would make the extraction operation riskful, and the benefit derivable from it doubtful. In the case of which I have spoken above the retina turned out to be faulty, and but slight improvement was achieved.

The pyramidal cataract is an extremely rare form, and bears

the appearance of an elongated cartilaginous pyramid fixed firmly on the anterior surface of the lens. It is considered by Stellwag to be identical with the more common central opacity of the capsule, except that the deposited matter is built up by successive layers behind, and is pushed forward into a pyramidal shape through the pupil. A single and very remarkable case of this disease came under my notice two years ago, in a child in which both pupils were occupied by two white cartilaginous-looking cones, one somewhat longer than the other. In the natural state, the pupil, which was abnormally contracted, was entirely occluded, and there was hardly any sight; but on dilating it, the base of the pyramid appeared to be the only opaque spot on the capsule. Having introduced a cataract needle through the cornea I found the pyramid perfectly hard, and, on a little pressure, it became detached from the lens and fell into the anterior chamber, whence I was obliged to remove it by a small incision. Within a few days the entire lens became cataractous, evidently in consequence of the laceration of the capsule and admission of the aqueous humour, and it was afterwards successfully removed by keratonyxis. I think this proceeding, though involuntary in my case, would be safer than proceeding to extract in the first instance.

Extensive capsular opacities, with or without lenticular cataract, frequently cannot be treated satisfactorily by division without subsequent removal of the capsule. Nevertheless, I have usually treated them by that procedure in preference to linear extraction. I have found that the needle may be used with great freedom in such cases, because the capsular sac is tougher than usual, and if it be freely torn in all directions it will generally shrink out of the field of vision, and when the lens substance has been dissolved will leave a good open pupil and almost perfect vision. Secondary cataracts in such cases seldom give trouble, because, as no adhesions to the iris exist, the capsule has not been prevented from retracting up towards the canal of Petit.

A peculiar and unusual form of the capsulo-lenticular cataract is the fluid cataract or *cataracta lactea*. In it the entire lens substance breaks down into a chalky fluid which is enclosed in the complete capsule which, in itself, is commonly a network of opacity. The fluid cataract is not difficult to distinguish, and on piercing it with the needle the milky contents are evacuated, filling the anterior chamber and completely obscuring the patient's sight and operator's view. In a couple of days this milky *débris* will be absorbed, and the capsular network will be seen *in situ*. The pupil may be cleared of this obstruction either by a liberal use of the needle at the time of the evacuation, or by a subsequent operation. The central cataract

is a peculiar form in which the opacity is confined to the nucleus, and to a few fissures which extend to the periphery, but does not differ in any respect from the ordinary capsulo-lenticular form. All the foregoing forms, which are usually congenital or occur in early life, are eminently suitable for the absorption treatment, and they may be dealt with by division through the cornea without the least hesitation, yielding results almost always better than those given by linear extraction and spoon operations, and being, at the same time, attended with little or no risk.

The soft stellate cataract, which is ordinarily developed between the ages of 35 and 50, is still more adapted for the operation of division, because it is seldom accompanied by any capsular opacity.

In the selection of a case for extraction, the point on which I would particularly dwell is, that we should be quite certain that the solidification of the lens is complete in all its parts. This is a precaution which, perhaps, does not receive as much attention as it deserves. When an operation has been once decided on, the patient, especially if he is a business man, is usually anxious to have it over, and the surgeon may be himself disposed to close the matter at once. I think it is of great importance that this temptation should not be yielded to, for I have found that, as a rule, a case in which any part of the cortex has been soft and immature, has turned out to be troublesome in the operation, and not satisfactory in its result. The leaving of scraps of cortical cataract in the anterior chamber, is, I believe, one of the most fertile causes of secondary iritis, and I have seen cases in which failure of union in the flap has been attributable to such cases. Moreover, in the case of an immature lens, abundant fragments frequently remain in the capsule after the escape of the body of the lens, and becoming opaque, give rise to secondary cataract.

It is easy to make sure that no such fragments occupy the pupil, but hardly possible to detect them when hidden in the angles of the anterior chamber, where they will be likely to do much greater mischief. All authors advise such fragments to be removed with the scoop; but although I concur in the necessity of doing so when they can be found, I object very much to the introduction of an instrument into the eyeball at the risk of bruising the iris, and disturbing the vitreous, if such procedure could be avoided. I, therefore, never attempt an extraction until I have fully dilated the pupil, and satisfied myself as far as possible that the circumference of the lens is thoroughly opaque, and I rarely fail to find the pupil quite black and clear when I make my examination previous to closing up the eye after operation.

I always operate on the left eye from the front of the patient, and I do not believe in an adroit incision being made with the left hand, except perhaps by a left-handed person. Mr. Wolfe, of the Aberdeen Infirmary, says he always operates so, and it has been the boast of some operators that the vastness of their manipulative experience has enabled them to acquire a marvellous sleight of hand for this purpose. I confess that I do not find it too easy to make a flap of the exactly correct size, in the exactly correct place, without injuring the iris, and I should be very sorry to risk my patient's eye for the sake of displaying my cleverness in manipulation. On this point Mr. Haynes Walton says:—"It is notorious that extraction in the left eye is much more frequently attended by failure than in the right, and the occurrence is, of course, attributable to the greater difficulty offered by the position of the eye." Excepting the temptation to an operator to display manual dexterity, I know of no reason for such failure in left eye extractions, nor do I think that there is any "difficulty offered by the position of the eye." If the patient be placed lying quite close to the side of the table, I think the operation from the front will be found as convenient as that from behind.

I have recently stated at the Surgical Society that, until I have occasion to change my mind, I shall never attempt a capital eye operation without the use of ether, and I repeat here that I do not think any operator will in future be justified in attempting to extract without its help.

The older writers on ophthalmic surgery, including Mackenzie and Lawrence, give minute directions for the steadying of the eye by the fingers, and the method which is now usual of fixing the globe with a forceps is not mentioned by them. On the other hand, some of the writers of the present day, including Stellwag von Carrion and Soelberg Wells, mention fixation with the forceps as an operator. I consider perfect stability of the eye and the alternative which may be dispensed with by the skilful maintenance of a pressure to counterbalance the force necessary for puncturing the cornea, are essential to the making of a good flap, and as I know of no efficient means of obtaining such a condition, except the fixation forceps, I always use it to steady the eye. Mr. Soelberg Wells says:—"The chief difficulty of operating without fixation is that the eye may roll swiftly inwards directly the puncture is made, or even before, so that the cornea becomes almost hidden in the inner canthus, and the knife has to traverse the anterior chamber and make the counter-puncture, without the operator being able to see its course. This will prove extremely embarrassing to the beginner, and may even unnerve him for the remainder of the operation." This opinion perfectly coincides with my own

experience, and having at first always operated by steadying the eyeball with my fingers, I now never attempt to do so without fixing it firmly with the forceps. I confess I do not like the idea of lacerating the conjunctiva, however slightly, as this method cannot fail to do, but I cannot say that I have ever seen any subsequent ill result from the practice, and if I did I should, nevertheless, consider that the advantage of immovability of the eyeball during the operation would abundantly repay the risk.

The ordinary fixation forceps I have found very ineffective. Its bite is very minute and very sharp, and it is liable to tear away from its hold on the conjunctiva just at the moment when its services are most wanted ; I have, therefore, obtained from Paris a forceps which takes a wider and more effective grip, and inflicts upon the conjunctiva no injury of more moment than a contusion. Mr. Soelberg Wells, Mr. France, of Guy's Hospital, and others, direct the eye to be seized a little below or above the cornea, according as the section is to be made above or below. Mr. Macnamara, on the other hand, advises the hold to be taken close to the equator of the eye, and internal to the cornea. I think the latter method of fixation is much the best, for I have found that if the hold be taken below or above, the position of the operator's hands is awkward, and the eye rotates more or less on its axis when the pressure of the puncturing knife is applied to it. My own rule is to seize the conjunctiva immediately above the spot where I mean to make the counter-puncture, and thus I not only keep my left hand out of the way, but I have my fixed point directly opposite to the point of entry of my knife, and the exact place for my counter-puncture is marked for me.—*Med. Press and Circular, Dec.* 18, 1872, *Feb.* 5 *and* 19, 1873, *pp.* 524, 105, 153.

64.—SECTION OF THE ORBICULAR MUSCLE AND INTEGUMENT AT THE OUTER CANTHUS, AS A PRELUDE TO THE EXTRACTION OF CATARACT.

By Edwin Chesshire, Esq., Senior Surgeon to the Birmingham and Midland Eye Hospital.

Before operating for extraction of cataract, I have recently been making a section at the outer canthus through the fibres of the orbicular muscle and the integument; and I have found so much advantage from the proceeding, that I wish to submit the plan to the notice of my professional brethren, in order that it may be more fully tested. I have done five extractions

on this method at present, and in every case complete success has resulted.

The advantages attending division of the orbicular muscle at the outer canthus, before making the corneal section, are, more extensive exposure of the globe, which enables the operator to manipulate his instruments, and to make his section through the cornea with greater ease. And the spasmodic contraction of the orbicular muscle being overcome, the operator is left to complete his operation at his leisure; while all risk of sudden protrusion of the lens, followed as it sometimes is by prolapse of the iris and escape of the vitreous is almost entirely avoided; and the contraction of the lids on the globe, which is sometimes a troublesome symptom in the after-treatment of cataract-extraction is prevented.

With division of the orbicular muscle, the wire speculum, which greatly facilitates each step of the operation, may be used without injury or annoyance to the patient. No sutures are required, as the divided surfaces readily unite, and scarcely leave a trace behind them. All that is necessary to be done is to keep the eyelids nicely in apposition for a few days after the operation by means of strips of court-plaster. All bandages and other coverings after extraction are to my mind objectionable, as it is important to have the fullest opportunity of examining the appearance of the lids without disturbing the patient by the removal of external appliances. Moreover, the support afforded by the lids to the corneal flap, when nicely kept in position by strips of court-plaster, is very agreeable to the patient. Spasm must be brought on, and the partially healed corneal flap may be opened, by the removal of bandages, wool, &c., which may have become adherent to the lids.

The operation is done as follows. A wire speculum is placed between the lids, to enable the operator to make his section through the muscle and integument at the external canthus with precision and ease. I have made no allusion to the mode of extracting, as the plan I propose is equally applicable to all extractions. Suffice it to say, that I always use Graefe's knife; and that Graefe's or Liebreich's operations are selected, as may appear most suitable to the particular case. I never use chloroform or ether in extraction, as the sickness which frequently follows their administration far outweighs any advantage that may otherwise result from the use of anæsthetics during the operation; and with the orbicular section, the globe being more under control, they are still less required. Where great neatness is required, the section may be made subcutaneously. — *British Medical Journal, April* 5, 1873, *p.* 369.

AFFECTIONS OF THE SKIN.

65.—ON A NEW METHOD OF TREATING ULCERS.

By Philip Cowen, Esq., Resident Medical Officer, Islington Workhouse Infirmary, Upper Holloway.

[The number of ulcers of the leg occurring in a workhouse infirmary must be, under the use of the ordinary lotions and ointments, exceedingly tedious to the medical officer.]

It occurred to me on reflection, that, from whatever cause arising, whether constitutional or local, an ulcer could be considered as a local asthenia of skin and parts beneath—a local weakness and loss of plasticity, a brittleness where softness, elasticity, and pliancy, yet strength should exist, a local tendency to degeneration and death. Whether the cause was from venous varicocity, or blood-pressure from other causes, as indolence, or disease of the liver or heart, or from general decay of the tissues from intemperance or other enfeebling vices, or from senile decay, or want of food, or general feeble constitution, or from scrofula or syphilis; from any of these causes the ultimate result is, in an ulcer, the weakening and giving way of structures whose normal condition is to act as covering and protecting sheaths.

In several of these cases the skin is specially weakened, in others gives way through pressure; and in all cases the skin of the legs, from its depending, weight-bearing position, suffers the most. Knowing, as we do, that an ulcer has power of absorbing matters applied to its surface (anyone can try the experiment with blackwash to a moderately sized ulcer for a few days, when mercurial salivation will begin), it occurred to me to avail myself of so excellent a property by applying locally matters having nutritive powers, so that the skin might be nourished locally at the weakened and degenerate spots, to enable the skin to take up such materials as would nourish its weakness and convert its brittle state into a plastic and healing one.

The natural secretion of an ulcer, the so-called laudable pus, may it not be a nourishing juice specially thrown out to feed the young growing granulations? If so, can we not add to this by artificial manuring?

Such is the theory; and I beg to record what has been the result of the practice. To carry it out I made the following mixture of glutinous ingredients:—Flour, four ounces; powder of acacia, one ounce; powder of tragacanth, half an ounce; one egg; chalk, two drachms; cold water, one pint. These were all mixed together, and placed on the fire in a saucepan.

Just as it began to boil, or after boiling a minute, it was removed, and allowed to cool. If found too thick, it was made thinner by adding a little boiling water, and stirring, so that it was of the thickness of ordinary paste; thin enough to be spread over the ulcer by means of a little brush, yet so thick that it will remain on the ulcer. Probably such a mixture is not necessary; either the flour-paste alone, or the acacia, might be sufficient; but I prefer it as it stands. The patient, provided with a pot and brush, thickly paints the ulcer all over three or four times daily, and covers the ulcer with a thin piece of soft rag. No other treatment nor washing is had recourse to, except to remove the rag. To keep the materials sweet, only sufficient is poured into the patient's pot for the day (pot and brush washed daily). The flour, acacia, tragacanth, and the egg, supply the ulcer with all the necessary materials for its repair; the chalk has a further good effect, by supplying lime.

Now as to the results. During the six weeks I have tried the remedy, eighteen cases have been so treated—in fact, almost all the cases of ulcer we have had.

G. G., aged fifty-seven; a drinker. Admitted August 13th. Leg ulcer, three months, nearly size of palm of hand. No previous treatment. Applied the paste directly he was admitted. All healed in three weeks.

W. W., aged fifty-seven; degenerate body. Two small ulcers, one on each malleolus; eight months; nothing would heal them. Paste applied; rest in bed. Healed in three weeks.

S. C., aged fifty-nine; general debility. Leg ulcer four inches by two, irritable, and spreading. Admitted August 8th. Had ulcer six weeks. Healed in six weeks.

J. T., aged seventy-three; decay. Had ulcer, more or less, twenty years; this time open two years. A large ulcer, eight inches by six, covering front of leg. Healed in six weeks, all but a square inch, which will soon be also well.

J. G., aged fifty-three; a degenerate drunkard. Leg ulcer eight years; this time open eight months. Healed in five weeks.

R. L., aged thirty-eight. A generally perforated condition of skin of leg; debility and syphilis five years; open this time six months. Healed in six weeks; paste locally, iodide of potassium internally.

J. K., aged eighty; senile decay. Large ulcer of leg two years. Half healed in six weeks. (I am not inclined to heal further on account of his age.)

W. B., aged thirty-seven. Ulcer of leg two years; circumference nine inches. Rapidly healing in four weeks.

W. B., aged thirty-eight. Severe ulcer on leg two years; unhealthy skin. Ulcer healing rapidly in six weeks.

M. H., aged sixty-three. Very large ulcer; leg much swollen; three years. An inch of cicatrix all round in a week.

J. W., aged fifty-eight. Ulcer of leg three years. Rapidly healing in a fortnight.

R. B., aged eighty-five. Very large deeply excavated ulcer; open eight years. Transplantation tried and failed. In a month granulations gained surface, and ulcer filled up; the skin process is beginning.

W. W., aged thirty-one. Leg ulcer three years. Half the ulcer healed in a fortnight.

W. G., aged thirty-five. Leg ulcer ten years. Transplantation failed. Gradually healing, but slowly, under the paste treatment.

S. W., aged sixty-six. Leg ulcer ten years. Much better since paste applied for three weeks. Healing slowly.

E. —, aged fifty-four. Leg ulcer five years. Partly healed by lotions; now healing much more rapidly under paste.

J. H., aged thirty-four. Large leg ulcer, three years; partially healed under a lotion consisting of dilute nitric acid and opium; then came to a standstill; now healing under paste.

There have been two cases of general ulceration from want of food, and several cases of syphilis, which it was not thought advisable to treat with the paste.

There are certain unusual conditions which arise under this treatment which are worthy of notice:—

1st. Islands of skin or cicatricial tissue arise in some cases in the centre of the ulcer, as well as from the circumference.

2nd. There is for some days after applying the paste a large increase in the ulcer secretion; this afterwards becomes normal.

3rd. The remedy is a painless one.

4th. The cicatrix has a peculiarly healthy, strong appearance.

That it is not the rest in bed, nor the pure air of this locality, nor the regular diet and cleanliness, alone, because, useful as all these are, we have not found unusual results with other symptoms of treatment. The cases we get in workhouse practice are, as a rule, so unfavourable in persons whose bodies are degenerate in every sense, that any plan of treatment which succeeds with them must still more succeed in the healthier individuals in private practice. As to the propriety of healing up old ulcers in aged people, we take each case on its merits, often stopping short of completely closing them up.—*Lancet, Nov.* 16, 1872, *p.* 705.

66.—ABORTIVE TREATMENT OF FURUNCULI.

As soon as on any part of the body there is perceived that characteristic redness, round in form and variable in size, with a culminating point in the centre, which, red at first, soon turns to a greyish white, pour into a little saucer a thimbleful of camphorated alcohol ; dip three fingers of the right hand into the liquid, and gently rub the suspected part, especially the middle; moisten the fingers, and rub again in the same manner eight or ten times, for half a minute each time. After this friction, dry the place well, and cover it lightly by the finger with camphorated olive oil, to prevent the evaporation of the strength of the alcohol applied. It is rare for a blind boil or furuncle, at the moment of lessening, to resist four applications of this kind. Often they have been seen to decrease in inflammation, to dry up and disappear, after only one application. When many applications are necessary, it is well to let a certain interval of time elapse between them—for example, to make them morning, midday, and evening. They never fail to take effect.—*L'Abeille Médicale, and British Medical Journal, Dec.* 21, 1872, *p.* 687.

67.—FENESTRATED NON-ADHESIVE PLASTER FOR SKIN-GRAFTING.

By Dr. John W. Bligh, of Montreal, late House-Surgeon, Kidderminster Infirmary.

Having frequently experienced the want of a more suitable form of plaster than that in ordinary use for the dressing of ulcerated wounds upon whose surface pieces of healthy skin had been grafted, I was induced, after many experiments, to adopt the following simple but efficacious method of producing a plaster with the requirements I considered necessary.

An oblong or oval opening is cut in the centre of a strip of adhesive plaster, which should be of the requisite breadth and of length sufficient to reach one or two inches beyond the opposite sides of the wound for whose dressing it is intended. This opening or fenestrum is easily made by folding the strip in half, lengthways, and removing a piece from the folded extremity with a pair of scissors. Upon this strip, so fenestrated, a thin strip of gutta-percha tissue of the same breadth, but somewhat shorter, is then laid over its adhesive surface, and made to adhere by means of a little gentle pressure with the warm hand.

In placing this on care should be taken to make it lie evenly, and to extend equally on either side of the fenestrum. Being

thus prepared, it is placed over the wound in such a position that the skin-graft will be directly beneath the fenestrum, and seen through it as through a window-pane.

It will be found to possess the following advantages :—

1. The gutta-percha tissue will render the surface of the plaster covered by it perfectly non-adhesive, whilst those portions uncovered at the extremities will readily adhere to the healthy skin.

2. The fenestrum over which the tissue is seen stretched will be found transparent, so that the growth and development of the graft beneath may be viewed from time to time. Although, for all practical purposes, the gutta-percha tissue in ordinary use for surgical dressing will be found a sufficiently transparent medium, still where a more perfect one is required, as for clinical instruction, a thin layer of mica or talc may be substituted. This is a more expensive material, and of no superior advantage for general use.

3. It will be found stouter, and to retain the graft in situ better than the various transparent plasters now used. In addition to this, it is not so liable to draw into a twisted string as the latter almost invariably do.

In conclusion, I may say that if a non-absorbent adhesive plaster could be obtained for the purpose, it would be greatly advantageous, as then it might be allowed to remain on the wound for days without becoming foul. I have not in practice seen such a plaster used, but think it might be easily made by applying the adhesive material over a waterproof fabric instead of on the ordinary calico. Not only in this, but in other departments of surgery would a non-absorbent adhesive plaster be found useful—*Lancet, March* 8, 1873, *p.* 360.

68.—THE TREATMENT OF BOILS BY ALCOHOL.

M. Nelaton has for more than twenty years prescribed the use of alcohol for the prevention of these smaller abscesses which are so common amongst young people, and which so seriously impair the beauty of the face. It appears that this treatment is now extending, as some interesting details are to be found in a communication of M. Simon de Forges, of Sainte-Fourtaine, which appeared in the Revue de Thérapeutique. In speaking of boils, small outward abscesses, and other inflammations of the epidermis and of the derma, he observes that as soon as the characteristic circular redness appears on any part of the body, whatever may be its size, with a point rising in the middle, making it a greyish white, a thimbleful of camphorated alcohol should be poured into a saucer; the palm of the hand should be wetted with it, and this should be rubbed with

gentle friction over the affected place. The fingers should be again steeped, and the friction continued as often as eight or ten times every half minute. The place should be well dried, and before covering it up, a little camphorated olive oil should be applied to prevent the evaporation of the fluid.—*Journal de Médecine, and Practitioner, Dec.* 1872, *p.* 378.

SYPHILITIC AFFECTIONS.

69.—ON THE COMMUNICATION OF SYPHILIS IN THE PRACTICE OF VACCINATION.

By JONATHAN HUTCHINSON, Esq., Senior Surgeon to the London Hospital.

[The following paper by Mr. Hutchinson was read before the Royal Medical and Chirurgical Society.]

This paper contains an account of two series of vaccination-syphilis (each series containing but a single case) which have come under Mr. Hutchinson's notice since his last communication on the subject in 1871. These two cases (forming the author's third and fourth series) are prefaced by a few remarks referring to cases published by others on the continent and at home; the author also re-asserts the great importance of making all such cases public. The latter part of the paper is occupied with general conclusions and recommendations drawn from a consideration of all the cases which have come under Mr. Hutchinson's notice.

Third Series.—Case.—This patient was a respectable small tradesman, forty-six years old, who came under Mr. Hutchinson's care at Moorfields Ophthalmic Hospital with double iritis. Examination disclosed the presence of a copious dusky rash and symmetrical ulcers in the tonsils. The ordinary questions as to syphilis were denied, and careful inspection of the genitals gave an entirely negative result. On one arm, however, two or three scabbed ulcers were found, as large as shillings, with dusky indurated borders; and there was an indolent bubo in the corresponding armpit. He said that the sores on the arm had broken out at the seat of the vaccination-punctures. He had been vaccinated three months before admission; the punctures took, and behaved as usual; but when just healed over, a month after the operation, they inflamed and broke out into sores. About a fortnight later (six weeks after vaccination) the rash appeared, and at the end of another month the iritis set in. The nature of the disease had not

hitherto been diagnosed, and no specific treatment had been used; under the use of mercury both iritis and rash were cured. This man was seen by many medical men at the hospital during the two or three months of his attendance, and there could be no shadow of doubt about the nature of his malady. Although his vaccinator had not diagnosed this man's case, he had had much trouble with the arm-sores, which from his subsequent account would appear to have been at one time almost phagedenic. Besides the patient, about twelve others were vaccinated from the same baby, three of them being the patient's children, young adults; in these three no ill results have occurred; the remaining cases have not been pursued further (for prudential reasons detailed in the paper), but the vaccinator believes that none of them had any trouble, save one or two in whom a little difficulty occurred in the healing of the vaccination spots. The vaccinator said that the baby used appeared in excellent health at the time. When seen by Mr. Hutchinson at eight months old it was fat and well grown, the only sign of inherited syphilis being the markedly sunken bridge of the nose—a symptom to which the author attaches considerable importance, and from which he predicts with some confidence the future occurrence of confirmatory events. The child was the third, and the only living one, the first two having died in infancy. In favour of this man's syphilis having been gained during vaccination we have the occurrence of induration, &c. in the vaccination-scars at exactly the interval which is known from former cases to elapse between inoculation with syphilitic virus and formation of the chancre, the occurrence of axillary indolent bubo, the eruption and other secondary symptoms following the arm-sores at the proper period, and, lastly, the total absence of any trace of chancre elsewhere and the extreme improbability of syphilitic inoculation of the vaccine sores after the vaccination. Against this conclusion there are only the negative facts afforded by the apparent immunity (which may, however, yet be disproved) of the other persons vaccinated, and the slight evidence of syphilis in the vaccinifer; the latter being what is to be expected, since no one would think of vaccinating from an obviously syphilitic child.

Fourth Series.—Case.—A lady about forty-five, who came to Mr. Hutchinson as a private patient in December 1872, for a vascular growth from the urethra. During examination the remains of a copious, dusky, evidently syphilitic rash were found. On inquiry, she stated that she had been very ill after vaccination, and had had a severe rash and inflammation of one eye. Further examination showed the presence of a dusky scar at the seat of one of the vaccination-punctures, very

different indeed from a normal vaccine cicatrix; synechiæ were also found in the left eye, proving past iritis. She was vaccinated in May, 1871, by four punctures, none of which took; just a month later one of them inflamed, and became a hard-edged ulcer, lasting three months. Two or three weeks later (about two months after vaccination) the rash appeared copiously, and she fell into ill health. From the vaccination in May to the early part of September, she had no specific treatment, which probably accounts for the severity of the rash, &c. After this she took small doses of iodide of potassium and bichloride of mercury, under another practitioner, for nine months, when she ceased all treatment, and went for two months to the sea-side. At the end of this period her left eye inflamed (iritis), and the rash, which had been nearly well, relapsed. For the iritis she was treated at Moorfields Hospital by a colleague of Mr. Hutchinson, its cause and origin being suspected, but not followed out. It was several months after her admission to the hospital that she came under the author's care for a complaint having no connexion with the syphilis. She was vaccinated from a baby's arm, and at the same time her two grown-up daughters. A number of others had previously been vaccinated from the same child, but these have not been traced. The two daughters, however, appear to have escaped all contamination. The baby is said by the vaccinator and its own mother to have looked quite well at the time. As soon as dentition began, however, it had some very troublesome sores about the anus (? condylomata), for which it was under treatment three months at a dispensary. It is the third child. All are living. The eldest, a boy about six or seven years old, shows no signs of inherited taint; the second, a girl of five, now has a large forehead, and she had exactly the same sores about the anus and at the same age as the vaccinifer; the vaccinifer itself also now has a large forehead. The author calls attention to the fact that these two cases of vaccination-syphilis were not, as were the first and second series, sent to him because he was known to be interested in the subject, both of them having occurred in the ordinary course of practice. Several cases of supposed syphilis from this cause have been sent to him, but the diagnosis in these was not confirmed.

Conclusions and general remarks based on the four series of cases.—These are summed up chiefly as answers to certain questions. The author first asks: What are we to infer from the circumstance that when syphilis is conveyed in the practice of vaccination it does not affect all those vaccinated from the tainted source? And he answers: We must believe that the specific poison of syphilis is either not contained in the vaccine

lympth at all, or is not equally diffused through it. Thus, in the first series of cases, two out of twelve vaccinated escaped syphilis; in the second series, out of about twenty-six vaccinated more than half escaped; while in the third and fourth series only one out of at least twelve vaccinated from each vaccinifer is known to have been syphilised. It will be borne in mind, however, that the last two series have purposely not been followed up exhaustively, and that the proportion tainted with syphilis is not improbably greater than appears at present. Again, from the evidence of these series of cases there is no doubt that we may vaccinate from a tainted vaccinifer without conveying syphilis; and, on the other hand, it is possible to convey syphilis either with or without the production of a normal vaccine vesicle. Vaccination from a child evidently syphilitic is known to have been done inadvertently several times without bad result, and probably it has often occurred without being known. These points of clinical evidence make it highly probable that the syphilitic virus is not contained in the vaccine virus, but is derived from, or associated with, some cell-elements of the blood, and probably these need not be visibly red. This is confirmed by experimental evidence, for syphilis has been successfully produced by inoculating the blood of a patient in the secondary stage, and in the case referred to the dates, &c., agree closely with those observed in the author's series. Next, Need blood be used in vaccination in order to convey syphilis? The author thinks that probably it is enough if the material used has been mixed with colourless exudation from the blood as occurs when the vaccine vesicle is allowed to drain in order to furnish more lymph. This is confirmed by the fact that the vaccinators in the cases in question asserted that they always scrupulously avoided making the vesicle bleed; in none of the instances is there any history that the lymph was visibly bloody; while it is well known that many men of large experience do allow the vaccine vesicle to weep. According to this supposition, as soon as the first contents of the vesicle are exhausted the risk begins. Third: If the syphilitic virus and the vaccine virus be implanted at one and the same time, what will be the course of events? If the patient is susceptible of vaccination the vesicle goes through its usual phases and heals, and nothing more happens till the end of a month, when the scar indurates and the chancre forms. In some cases, however, the vaccination sore never heals, and in these the scab somewhat obscures the characters of the chancre.

Characters of the vaccination-chancre.—It begins as a little, red, firm, glossy tubercle, which gradually increases in size, and becomes harder. In about a fortnight it usually ulcerates,

the sore giving off but very little discharge, and with a hard base and edges. If no mercury is given it may remain open several months; in one case it probably became almost phagedenic. Sometimes there is from the first a good deal of inflammatory effusion at the base of the sore, and much purulent secretion and scab on its surface; its specific characters may be thus quite hidden. These cases are generally in children.

Treatment of the vaccination-chancre.—Mr. Hutchinson feels no doubt that should a vaccination-scar take on the induration characteristic of a chancre, and should the other facts of the case corroborate the suspicion, it is the surgeon's duty without delay to commence the administration of mercury. The influence of mercury in retarding and greatly diminishing the severity of the primary and secondary symptoms was most marked in all those cases which came under care at an early period (sixth week), as in the first series. Indeed, in this series the eruption was so retarded as to induce scepticism in not a few minds as to the correctness of the diagnosis; several of them, however, from five to seven months after vaccination had undoubted, though mild, secondary symptoms. In the second and remaining series of cases, however, the disease was not discovered until much later, and most of them suffered very severely from secondary symptoms, the last two cases (third and fourth series) particularly so. As regards tertiary symptoms, it is yet too early to say anything concerning the primary and secondary symptoms. Mr. Hutchinson says: "I cannot speak too strongly as to the vast apparent advantage of the mercurial plan. The lesson of the cases is very clearly opposed to the too prevalent modern doctrine that it is well to wait for secondary symptoms before commencing specific treatment, and would appear to indicate that the latter should be adopted as soon as ever the condition of the chancre permits of an accurate diagnosis."

As regards *prevention*, Mr. Hutchinson thinks it of the first importance to diffuse the knowledge that vaccination-syphilis is possible widely amongst the profession; until all medical men believe in it, and fear it, we shall still be very unsafe. It is important next to avoid vaccinating from children whose parents are not known to the vaccinator; and, further, to decline, for the most part, using all first-born children, waiting until, by the development of one healthy child, a guarantee of freedom from taint on the part of the parents has been given. Lastly, the avoidance of blood-stained lymph and of recent exudation from the walls of the vesicle is a sufficiently obvious precaution, and needs no further mention.

Dr. GEORGE HARLEY said that the importance of the paper could not be denied, and that the facts had been ably and

interestingly brought forward. The former paper had excited in the profession, and in those outside of it, great disquietude. There was a party who seemed to hold out against vaccination, and the first paper seemed to strengthen them. He thought that the thing ought to be put clearly either for the danger or the innocuity of vaccination. The question was difficult to solve whether there was any danger of syphilis through vaccination; it was often suspected, but there was nothing positive. Mr. Hutchinson appeared to have done this. There was one point of great importance: how long does the poison remain in the system? (How soon and how easily it may enter the system we all know.) Mr. Hutchinson had referred to cases where blood had been inoculated; he remembered seeing in the hospital at Munich, about twelve years ago, an old woman, aged seventy, on whose back between the shoulders there was a large chancre, which had been produced by the following experiment: some blood had been taken from a patient on whom the secondary symptoms were just disappearing, and injected under the skin of the old woman. So that syphilis can be conveyed by the blood. Then what interval should be allowed to intervene before it was considered safe to vaccinate from a child who had secondary symptoms? A gentleman some years ago consulted him for some chest affection; there was a slight protuberance on the prepuce; he laughed at the idea of syphilis, as it was eighty days since he had been exposed; fourteen days afterwards the spot became tender, softened, and sore, and this was ninety-three days after inoculation. Mr. H. Lee saw the patient with him, and the piece of the prepuce was excised; under the microscope the fibroid elements usual in a chancrous formation were seen; the patient had no eruption, but the wound was a long time healing, seven or nine months, and then under the influence of mercury. He had married, and had several children, but had never had secondary symptoms. This would prove that ninety-three days may pass before symptoms appear. He agreed with Mr. Hutchinson in not thinking that syphilis could be conveyed by pure lymph, but thought it would if blood or pus, or mucous corpuscles from the walls of a vesicle, were inoculated. Security could only be obtained by using the first drops taken from the vesicle; in this way there would be no danger to the profession or to the public.

Mr. De Meric said there was no doubt as to the conveyance of syphilis by vaccination. He thought the evidence brought forward to-day was not so strong as in the previous cases. He thought the condition of the vaccine should be considered; so many escaped, and only one or two of each series fell victims; it would be well to inquire if the victims had not had it before. He was not quite satisfied with the two cases; he thought in

the first it might be explained otherwise; the man might have been syphilitic when vaccinated; the symptoms described were not doubtful. The second case seemed to him weak; the two daughters escaped, and only the mother was affected. Mr. Hutchinson had spoken of the means to be employed to avoid the danger, and these all must admit. Vaccination must always have been carefully performed here, as mishaps have been known in Italy and Germany, and not here except in Mr. Smith's case. The advice given to vaccinators was excellent, but he did not think it was efficient. A reformation was needed. The period for vaccination ought to be extended to the sixth month, and then there would be time for the symptoms to appear; for an infected child may appear quite healthy at the third month. Then there was another thing, vaccination from the heifer should be employed at times. The ex-royal family of Naples were thus vaccinated, and why should not others have the same advantage? He thought this mode should be encouraged, but here it was withheld. He had seen it used in Paris, but perceived that private enterprise would not make it succeed here; it would require the advocacy of the Privy Council. He saw Dr. Seaton, who discouraged the mode, saying that there was no vaccination-syphilis here, and so it was not necessary. In some countries, as Italy, the people had a choice.

Mr. HENRY LEE said that the cases appeared complete, but the same idea had struck him as Mr. De Méric—it was not shown that the patients had not had syphilis; for if once a person had had syphilis, vaccination relit it up. The worst case of secondary syphilis he had seen was in a gentleman after vaccination; symptoms had been set up lasting for years. Then why do some take it and not others? This he thought might be explained by the fact that syphilis was not a persistent disease; it had its time of development; it subsided and recurred; the poison took in one and not in another. If blood was taken then it produced syphilis; so if lymph taken from a person likely to have an outburst were used, syphilis would follow.

Mr. GEORGE COOPER said he had been a public vaccinator for twenty-seven years, and had vaccinated many thousands, but he had never seen a case of syphilis after vaccination. He did not deny that it might occur, but he had never seen it. He believed that if the vesicle were not wounded, and only pure lymph used, no syphilis could occur.

Mr. HUTCHINSON, in reply, said that, as to the duration of syphilis in an individual, and how long we should wait to avoid danger from vaccinating from an infected person, all would agree that if a person has once had syphilis it would always be

dangerous to vaccinate from him. With regard to his cases and their value, in the first the man had a chancre and nothing else formed. As to the vaccinifer in the second case, that child and an older one suffered from ulceration of the anus when teething; the surgeon who attended the child said he had no doubt it was a condylomatous growth; so the vaccinifer was syphilitic. Then the duration of the syphilis in the family was interesting. This child was born six years after marriage, and three years after the second. These were somewhat alarming facts as to the latency of the syphilitic virus. When the surgeon vaccinated the child he could not have supposed it was syphilitic; there were no symptoms then, and, if questioned, the mother could have shown her eldest child healthy. This mother had a baby at the breast, and she had promised to bring it to him that he might see if it showed signs of congenital syphilis. The laws of latent syphilis needed to be investigated. Some say that children never have it long latent—never show it after the fourth month. Mr. De Méric's proposition was good as to the age of a child when vaccinated, but he believed the blood could convey the taint, and yet no symptom be found in the vaccinifer, and the child might pass through infancy and only show it at puberty, as by iritis, &c. He (Mr. Hutchinson) did not see any weak point in the second case. In the first case vaccination-syphilis was not so clearly proved. Two children had died; but he could get no symptoms of syphilis, and had only the physiognomy of the vaccinifer to prove it at present. He had not spoken of vaccination from the heifer, as he did not think it came into his paper. He did not think compulsory vaccination could be maintained unless we allowed children to be vaccinated from other sources. As to the risk run in his second case, the lady wanted to be vaccinated from a heifer. The surgeon at last said this child was healthy, and used it, and syphilis followed; so there was difficulty in saying the child was quite free. There were no facts to prove that the persons were the subjects of syphilis before vaccination. Vaccination might affect a previously diseased constitution, but could never bring out in a person previously healthy symptoms of primary and secondary syphilis. Then there was the question, what degree of alarm was to be felt by the facts established? Was the occurrence of syphilis in this way a rare thing? He should say that if the gentleman in whose practice the second series of cases occurred had been asked that question he would, before he had sought out the cases, have said the same as Mr. Cooper had said. It was the same in the two series he had now brought before the Society. He had doubtless met with cases before this, as had other practitioners, but had never thought of them till his attention was called to them by others.—*Lancet, Feb.* 1, 1873, *p.* 169.

70.—ON VACCINATION - SYPHILIS.

By the EDITOR OF THE LANCET.

[Our own opinion of the cases given by Mr. Hutchinson, and referred to in the preceding article, would not be weighty, but the following remarks by the Editor of the Lancet are important.]

The proceedings at last Tuesday's meeting of the Medical and Chirurgical Society possess a great but melancholy interest. They mark, we fear we must say, a new and very considerable advance towards the proof that syphilis may be inoculated during the process of vaccination. Notwithstanding all the assertions which had been so freely made at various times that syphilis could be thus communicated, there had never been any sound evidence of the fact until Mr. J. Hutchinson, in 1871, related the history of two series of cases, in each of which primary and secondary symptoms had been communicated to several persons by one vaccinifer. We do not now care to go over the old French and Italian evidence respecting asserted outbreaks of vaccino-syphilis, for we have frequently intimated our opinion that the facts in all these cases had been put together with such carelessness and such an utter absence of patient sifting as must impress any unbiassed mind with the danger involved in basing upon them any conclusions respecting so serious a question as that of vaccino-syphilis. It was otherwise with Mr. Hutchinson's two series of cases brought forward in 1871. Even on that occasion the Lancet felt itself called upon to fulfil the function of *advocatus diaboli*, and to urge every possible objection and difficulty with which the supposed facts could be met, more especially until the persons supposed to be affected with chancre had corroborated this belief by developing secondary symptoms. But we did not hesitate from the first to admit that Mr. Hutchinson's mode of conducting his inquiries was far more reliable than anything of the kind that had been previously seen; and we may at once make the same admission respecting the histories which he related on Tuesday last.

As the paper and the discussion will be found in another part of our columns, it will only be needful here to point out the principal circumstances of interest in the two new series of cases.

The first (or, taking in Mr. Hutchinson's previous paper, the third) series of facts starts from the case of a well-conducted married man, aged forty-six, who applied at the Moorfields Ophthalmic Hospital on account of iritis, which was at once detected to be syphilitic, as it was accompanied with secondary rash, &c. He had been vaccinated three months previously;

but his sore, after healing, broke out again about a month after vaccination, and took on the form of hard chancre (with indolent bubo in axilla). A fortnight later a copious secondary rash appeared; the iritis occurred a month after this. The vaccinifer was a baby, who, when seen by Mr. Hutchinson (at eight months old), looked healthy, and showed no signs of syphilis except a sunken bridge of the nose; it was a third child, the first two having died in infancy. It is remarkable that, of twelve persons vaccinated from the same baby, only the man above mentioned suffered any harm; it is believed that he was the last of the twelve, and so got, not pure lymph, but either blood or serum newly exuded from the vessels.

The second (or fourth) series was brought to light through the case of a lady, aged forty-five, who applied to Mr. Hutchinson on account of a vascular growth in the urethra, but was discovered to be suffering from syphilitic rash. On inquiry, it appeared that she was vaccinated in May, 1871, that none of the punctures took, but a month later one of them inflamed and formed a chancre, which was followed by rash and iritis. The lady was one of three persons (the two others being her daughters) who were vaccinated at the same time from the same baby. The daughters suffered no harm. A number of other persons had been previously vaccinated from this child, but they could not be traced. Here, again, it is probable that the lady who got syphilised was the last of a considerable series vaccinated, and must have been inoculated with freshly-exuded serum, not the original lymph of the vesicle. The vaccinifer was looking well at the time of the vaccination, but afterwards, during its dentition, got condylomata; and an elder sister had condylomata and slight hydrocephalus.

We think, then, that the inference from the whole group of cases related by Mr. Hutchinson must be decidedly in favour of the *possibility* of communication of syphilis by the inoculation either of the blood of a syphilitic vaccinifer, or of the serum which oozes into the vesicle if the vaccinator be unwise enough to continue to take fluid after the first drop of lymph—the true product of the vaccination—has been exhausted. Not one particle of evidence has been adduced to show that the true lymph can be infected with syphilis; and, as our readers are doubtless aware, the evidence against such a possibility is enormously strong. And even the communication by blood, or by serum obtained after the first emptying of the vaccine vesicle, though it must now be admitted as a possibility, cannot for a moment be regarded as more than a very occasional result of these accidents. We are very glad to observe that Mr. Henry Lee had the sense and candour to point this out forcibly on Tuesday. He observed that, supposing constitutional syphilis

to be communicable by blood or serum, it was plain that this was no necessary process, but only happened when the constitution of the person from whom the inoculation was received chanced to be in some peculiar state of ferment which revived the dormant activity of the syphilitic poison. This must certainly be true, or syphilis would be far more widely diffused in the world than it actually is. By these arguments it is evident that we reduce to a minimum the chances of vaccinal communication of syphilis; for the latter event can only take place when all the following conditions are simultaneously present:—(1) A syphilitic vaccinifer; (2) an active condition of the syphilitic element of the vaccinifer's blood; but, at the same time (3) an absence of such external symptoms of syphilis as would deter any commonly upright surgeon from using the subject of them as a vaccinifer; (4) the gross imprudence committed, of employing either blood or the serum obtained after the emptying of the vesicle. It is an absolute impossibility that all these conditions can be more than very rarely fulfilled, and we therefore think that Mr. Hutchinson is gravely to blame for the tone of his remarks in his concluding speech at the meeting. Those remarks, when translated by the imperfect understanding of the non-medical public, will convey a most erroneous impression as to the prevalence of vaccino-syphilis, and will aggravate in a perfectly unwarranted manner the terrors of the laity. And as for the practical suggestion made by Mr. Hutchinson and another speaker, that the date after birth within which vaccination is compulsory should be altered from three months to six months (or, indeed, as Mr. Hutchinson suggested, to some indefinitely older age), in order that the freedom of the vaccinifers from syphilitic taint may be placed beyond suspicion, we must express our condemnation of any such proposal. To those who know anything of the enormous practical difficulties in so handling vaccination as to make it a really efficient prophylaxis against outbreaks of small-pox, we need hardly say that even the extension of time to six months would render compulsory vaccination almost entirely inefficient as a real preventive, and any further extension of the period would convert the whole affair of vaccination into a mockery, and turn our hopes of stamping out small-pox to vanity and delusion. It is a perfectly intolerable risk which we are asked to incur, and we trust that Mr. Simon will lose no time in denouncing a proposition which is fraught with national danger of the gravest kind, and which is utterly unjustified by the very small number of facts which so keen a clinical investigator as Mr. Hutchinson, with an enormous field of observation at his command, has been able to detect.—*Lancet, Feb.* 1, 1873, *p.* 175.

71.—VACCINO-SYPHILIS.

By George G. Gascoyen, Esq., Surgeon to the Lock Hospital, and Assistant-Surgeon at St. Mary's Hospital.

[The writer is unable to adopt the conclusion arrived at by Mr. Hutchinson, that the fourth series is an undoubted instance of vaccino-syphilis. He is disposed to regard it as a case of vaccination in a person already syphilitic, rather than one of syphilis conveyed by vaccination.]

These cases are of such extreme importance, and are liable to so many sources of error, that they ought not to be recorded as authentic so long as a reasonable doubt exists as to their true interpretation; and to arrive at this, it is, above all things, necessary that the patient should have been watched by a competent observer, especially at the commencement of the disease before the local symptoms have disappeared, so that the chain of evidence may be continuous from the beginning, and guaranteed by a responsible person; but in the case before us this does not appear to have been done, and it seems to me that there are many serious flaws and gaps in the links, to some of which I beg to direct attention.

The patient was vaccinated in May, 1871, and did not come under Mr. Hutchinson's care until December, 1872, so that more than a year and a half had elapsed between the suspected vaccination and her first examination by him. All, therefore, that Mr. Hutchinson is able to aver of his own personal knowledge is, that the woman had a dusky mark on her arm, and was suffering from syphilis at the time he examined her.

The early history of the case—accuracy in which is absolutely essential in such an inquiry—appears to have been derived from the patient herself; and, as it was obtained so many months after the occurrence of the symptoms, can only be judged *quantum valeat* by each of your readers; it certainly fails to convince. And even if given by an ordinary medical witness so long afterwards, such evidence would, in my opinion, be insufficient to lead to a satisfactory conclusion.

To corroborate the statement that after the vaccination the woman had "a hard-edged ulcer, lasting three months," the report mentions that there was "a dusky scar at the seat of one of the vaccination punctures, very different indeed from a normal vaccine cicatrix"; but this fact proves little. My own limited experience is that revaccination, even when followed by good vesicles, rarely leaves typical marks in healthy adults; and that it sometimes does leave dusky or discoloured scars in them, when the punctures have been followed by inflammation and ulceration; here, though, I am open to correction by others better qualified to give an opinion on this matter. But that

these troublesome sequelæ to revaccination are not infrequent in syphilitic persons I can confidently affirm, having seen several instances where it was attended by violent inflammation, with severe and persistent ulceration, which, on healing, left a superficial discoloured scar lasting many months.

I can also fully endorse Mr. Henry Lee's opinion, that revaccination will sometimes light up the dormant disease in a person already the subject of syphilis; and, without a previous knowledge of the patient, this may readily lead to a suspicion that impure lymph has been used.

A knowledge of these facts gives us, I think, a much more probable explanation of the symptoms which followed vaccination in this patient than by referring them to the very unusual occurrence of syphilitic contamination by vaccination; and, until further confirmatory data are obtained, we are warranted in withholding our assent from this uncommon accident as the cause of her disease.

In his reply to the remarks made at the meeting, Mr. Hutchinson is reported to have said:—"There were no facts to prove that the persons were the subjects of syphilis before vaccination." On the other hand, there were none to prove they were not; and, with all deference to his opinion, I think in the case now under consideration there *is* a strong point of evidence to show that the patient was, most probably, already syphilitic at the time of her revaccination. For she was vaccinated with her two grown-up daughters, from the arm of a baby which had previously been used to vaccinate a number of other persons. The contents of the vesicle, therefore, must have been exhausted before the patient and her daughters were vaccinated from it; consequently the same material—*i.e.*, the oozing or the draining of the vesicle—would be used for all three of them; but although the mother afterwards had a bad arm, and suffered from an attack of syphilis, the two daughters, equally prone to contract the disease, escaped.

This circumstance contributes, moreover, a strong argument that the vaccinifer was not tainted; and, indeed, from the report, it is by no means clear that the family, or this child, were syphilitic. The vaccinifer was the third of these children, all living. The first had never shown any suspicious symptoms; the two youngest, whilst teething, had been treated for sores about the anus, and both are said to have large foreheads. Although we may justly regard such symptoms with distrust, yet soreness about the anus during dentition is by no means pathognomonic of syphilis, unless the ulceration be distinctly condylomatous (mucous tubercles), which Mr. Hutchinson cannot positively assert, as he did not see the child until long after this had disappeared; neither is a slight enlargement of the

forehead necessarily of syphilitic origin, for this also may be produced by other causes. The grounds, then, for believing that the vaccinifer was syphilitic are extremely slight, and far more than counterbalanced by the rebutting evidence above-mentioned.—*Lancet, Feb.* 8, 1873, *p.* 219.

MIDWIFERY,

AND THE DISEASES OF WOMEN AND CHILDREN.

72.—ON THE TREATMENT OF SOME UTERINE DISEASES.

By Dr. Lombe Atthill, Obstetric Physician to the Adelaide Hospital, Dublin.

There are three methods of making applications to the interior of the uterus; one is the injecting of fluids into its cavity; another the introduction of a piece of solid caustic into the uterus, by means of Simpson's intra-uterine *porte caustique;* the third is the passing up to the fundus, a stilette armed with a layer of cotton or strip of lint saturated with nitric acid, with the acid nitrate of mercury, or some other active agent.

The first of these methods I have never tried, as it is a practice not free from danger, and not only so, but also much less certain and satisfactory in its results than either of the others.

The second I have frequently practised, in cases of imperfect involution of the uterus; where no inflammation exists its effects are most excellent, but it does not, so far as my experience goes, produce, by any means, so satisfactory results in the treatment of endo-metritis, as does nitric acid if properly applied.

The application of strong caustics to the interior of the uterus, of which, in my opinion, the fuming nitric acid is by far the best, is a practice now extensively carried out, not only in this city, but also in America. Our brethren, however, in England and Scotland seem as yet unacquainted with the advantages which follow this treatment. I am quite ignorant as to whom we are indebted for introducing into practice this method of treating chronic endo-metritis. Dr. Miller, of Louisville, U.S.A., in an excellent article published in the number of the American Journal of Obstetrics for August, 1871, claims to have been the first to advocate the application of remedies of this class to the interior of the uterus; his lectures, of which, however, I have not been able to obtain a copy, were published in 1855. Dr. Thomas, of New York, informs us that Dr. Marian Sims introduced the practice of thus employing fluid caustics in the treatment of intra-uterine disease into the woman's hospital in that city with great advan-

tage, and as Dr. Sims left America in the year 1862, he must have carried out the practice some time prior to that date.

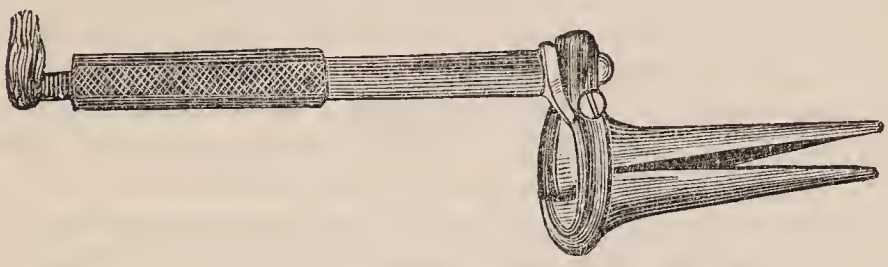
There can be no doubt, however, but that the first person who ventured to apply the strong nitric acid to the cavity of the uterus in this country was Dr. Kidd. Dr. Marian Sims's method of applying fluid caustic to the interior of the uterus, as described by Dr. Thomas, is, "To wrap a thin film of cotton round a probe, and, having dipped it into the fluid selected, to pass it up to the fundus of the uterus, and to keep it there for about half a minute." This, in the main, is identical with the plan advocated by Dr. Miller. This treatment is simple, safe, and painless, but, if carried out on the above method, the cauterization thus effected is not in general sufficient; the cervix and os internum are doubtless in all these cases relaxed and patulous, but not sufficiently so to prevent their pressing out much of the caustic with which the *film* of cotton is saturated, and if the uterus be, as is not unfrequently the case, retroflected or anteflected, it is hardly possible that any caustic will remain on the cotton when the probe has reached the fundus. It is therefore most desirable first to dilate the cervix still further by the introduction of one or two pieces of sea-tangle or sponge tent, and, when the application is about to be made, to seize the anterior lip of the uterus with a vulsellum, so as to bring it low and at the same time to steady and straighten the organ; you can now pass a stilette armed with a comparatively thick layer of cotton or roll of lint rapidly up to the fundus; indeed, if the case be severe or of long standing, this should be done twice, so as to insure the thorough cauterization of the whole inner surface of the uterus. I have practised this method frequently with great success, and in no one instance have seen any unpleasant results, though, at the same time, I freely admit that a cure does not invariably follow.

I have been thus minute in describing the method of carrying out this practice because some practitioners have still a great dread of applying powerful caustics to the interior of the uterus—a fear which is totally groundless. Applying strong nitric acid, in the manner described, to the cavity of the uterus, seldom causes any pain whatever. And in this respect its application differs entirely from that following the injection of even weak solutions of caustic into the uterus; grave symptoms, and even death, having followed that practice. Therefore, while I advocate the use of nitric acid and of the solid nitrate of silver as safe applications to the interior of the uterus, I strongly object to intra-uterine injection of any fluid in the treatment of the class of cases under consideration.

There is just one precaution needed in carrying out this prac-

tice, and that is to guard the cervix uteri, in cases where the cervical canal is healthy, from the action of the nitric acid, for if this precaution be neglected, contraction of that canal is likely to occur.

But the mode of applying nitric acid which I have described, and which is that adopted by others in this city, and until recently by myself, is liable to this objection, that it cauterized most freely the lower segment of the cervix, the part which in general requires it least, and which in many cases it is desirable should escape entirely. I have, therefore, devised this little instrument, which I may term an *intra-uterine speculum;*



it is, in fact, something like an aural speculum, only that it is expanded by means of a screw which works through a long handle. I have tried it, and it answers the purpose in view very well; namely, the protecting the cervical canal from the action of the acid, and the ensuring the thorough cauterization of the cavity of the uterus. It is only intended to be used after the cervix has been dilated, and not as a dilating agent. When it is employed, the duck-bill speculum may be withdrawn, as both the cervix and vagina are protected from the action of the acid; but it is not advisable to release the exterior lip of the uterus from the grasp of the vulsellum, as, were this done, the speculum might slip out of the cervix. The instrument is made of vulcanite, by Arnold & Sons, of West Smithfield, London. It is possible that one of platina could be made smaller and equally serviceable, but the expense of such an instrument would be considerable. I believe this instrument will prove of value in facilitating the treatment of intra-uterine disease.

Of numerous cases of endo-metritis, which I thus treated, I shall give very briefly the details of three. The first was evidently totally unconnected with pregnancy, her last child having been born twenty years previous to her coming under my care. She had also been a long time a widow. Ten years ago menstruation suddenly ceased, and she suffered from headache and dizziness. These symptoms yielded to treatment, and menstruation again became normal. Four years elapsed and then the periods began to become more profuse, were attended with very severe pain, and occasionally clots were expelled,

their passage being followed with but little relief. Leucorrhœa was present during the interval between the periods. She also suffered from constant pain in the left side, felt most intensely at a point midway between the spine and crest of the ilium. This pain, at first experienced only at each menstrual period, became, after a time, constant, being aggravated in intensity during the periods, sometimes, indeed, becoming at those times absolutely intolerable; there was also tenderness over the right ovary. The uterus was tender to the touch, was enlarged and retroflected. The introduction of the sound caused much pain and some blood followed its withdrawal. The cervix, was swollen and much engorged. To relieve this condition I punctured it, it bled freely, and, hoping to lessen the ovarian congestion, I directed 15 grains of the bromide of potassium to be taken thrice daily; this treatment was continued in for some time; blood being extracted locally at intervals of five days. The result was that the cervical engorgement was removed, menstruation became somewhat less profuse, and the ovarian pain much mitigated in severity; but treatment having been discontinued for a short time, the whole train of bad symptoms returned, and I became convinced that no permanent relief would be obtained unless I treated the interior of the uterus directly. I accordingly explained my views as to the nature of her case to this lady and to her son, himself a surgeon. She consented to undergo any treatment which promised relief from her sufferings. I commenced by introducing five pieces of sea-tangle bougie into the uterus; these dilated the cervical canal so freely that I passed my finger through the os internum and up to the fundus of the uterus; as I had anticipated, I detected a rough granular condition of its lining membrane, the lip of the uterus was then seized with a vulsellum and drawn down, and a wire armed with a roll of cotton thoroughly saturated with the fuming nitric acid, was passed up to the fundus and retained there for some seconds; this was done twice so as to secure a thorough cauterization of the whole interior of the uterus. I had the advantage of Dr. Denham's assistance in this case, and he can testify to the thorough manner in which the cauterization was performed. The patient was not chloroformed as she objected to being so. No pain followed. I kept this lady in bed for some days as a precaution, but no other treatment was adopted. The next period came on a little before its time and was profuse, but attended with less pain than previously. Since then her condition has steadily improved, the periods now last but three or four days, and are almost painless. This lady had been treated in various ways, without benefit, before she came under my care. I may here remark that if the nitric acid be

applied shortly before a menstrual period, that period is likely to be profuse, but this by no means indicates that the treatment is a failure, the subsequent ones, as in the present instance, frequently becoming normal.

The next is that of Mrs. ——, aged twenty-six. She was confined prematurely of her first child in December, 1870. She was not able to nurse, and recovered very slowly. For some months subsequently she menstruated at regular intervals, the flow not being at first excessive. She suffered, however, constantly from leucorrhœa which debilitated her greatly; for this she was treated by the exhibition of tonics and by vaginal injections without benefit. In the July following her confinement she observed that the menstrual period was not only greatly prolonged, but that the quantity of blood lost was excessive. From this date till the month of October, menstruation recurred regularly at intervals of but fourteen days, the flow lasting very profusely for seven days. The period which occurred immediately before my seeing her, commenced on the 18th October and lasted for a fortnight; on the fifth day of the flow, after having been, unfortunately, obliged to pass the greatest part of the night in attendance on an invalid, she was attacked with severe pain which she referred to a point immediately above the pubes; this pain was very intense, and had not entirely subsided when I saw her.

On making an examination I found that the uterus was very low in the pelvis; the cervix was soft, tumified, and tender to the touch; the fundus was evidently enlarged, anteflected to a considerable degree, and very sensitive, the slightest pressure causing great pain. The sound passed with ease to the depth of three and a half inches, but on pressing the point against the fundus she immediately complained of the great pain she experienced. The cervix when exposed to view was seen to be in a state of extreme congestion, while a copious glairy discharge issued from the os uteri.

The diagnosis was clear; an attack of acute endo-metritis had occurred in a uterus which was in a state of sub-involution, the acute attack having now passed into a chronic form; endo-cervicitis was also present. Puncturing the cervix was, in this case, productive of marked relief. The endo-cervical discharge became much less copious, and the tenderness on pressure was greatly diminished, and vaginal aspect of the cervix assumed its normal appearance; yet menstruation continued profuse, and was attended with great pain. This patient resided some distance from town, and I would not venture to dilate the cervix in a patient whom I could not watch. I accordingly, several times, used the nitric acid in the mode recommended by Dr. Sims and Dr. Thomas, but no improvement followed.

I therefore decided to introduce ten grains of the solid nitrate of silver up to the fundus, and leave it there to dissolve. This I accordingly did. A good deal of pain followed the application, but it subsided in a few hours, and the patient rapidly improved. Menstruation became normal, and now, after the lapse of a year, she continues quite well.

In the last case which I allude to the symptoms were in many respects very different from either of the former. The patient had borne six children, the last nearly ten years prior to her coming under observation. Ever since its birth she had suffered from menorrhagia, with profuse leucorrhœa, in the intervals between the periods. Of late the flow had become very excessive, lasting from sixteen to seventeen days; but exhausting as this continuous drain was, she complained even more of irritation of the bladder, which compelled her even at night to micturate every hour, or at most every two hours, and during the day the desire to do so was constantly experienced. In her the vaginal aspect of the cervix and the cervical canal were perfectly healthy, but the fundus was enlarged, globular in shape, and its cavity elongated.

The diagnosis was, in this case, obscure; the menorrhagia could be accounted for by the presence of an intra-uterine tumour. The excessive vesical irritation, manifested by the incessant desire to micturate, was not, however, a usual accompaniment of the latter affection. A correct diagnosis could only be arrived at by a digital examination of the interior of the uterus. To effect this the cervix was fully dilated; it disproved the existence of any tumour, but detected a roughened granular condition of the lining membrane of the body.

In this case, also, I cauterized the whole interior of the uterus very freely with fuming nitric acid; no pain followed, nor was any special treatment subsequently needed. The night following the day on which the operation was performed this patient slept soundly, without an opiate, and for the first time for years was not disturbed by the desire to micturate. I had a letter from this poor woman recently, and she speaks with delight of the comfort she now experiences. This case is interesting in proving not only how obscure may be the symptoms, and how severe the sufferings occasioned by disease of the mucous membrane lining the cavity of the uterus, but also for how long a period these cases continue.

In the last case the particulars of which I have detailed while irritation of the bladder and menorrhagia were constantly present, there was no cervical inflammation, and the uterus itself was but little tender to the touch. I therefore did not practice any preliminary treatment, but proceeded at once to explore

the interior of the uterus, and finding that the mucous membrane lining it was in a granular condition, I applied the fuming nitric acid freely, with the most satisfactory results.

I desire to impress on the Society the fact that nitric acid properly and carefully applied to the interior of the uterus is a perfectly safe and painless and at the same time efficient application. I do this the more emphatically, because a writer in the number of the Edinburgh Medical Journal, for February, 1872, thus expresses himself with reference to the subject:—

"Patients treated as he (Dr. Atthill) suggests, will certainly have no more menorrhagia, they may be glad if they have even a uterine cavity left." And again, a little further on—"The treatment is one which may have been tried, but which we are pretty sure has never been carried out."

Now with respect to the last of these assertions I have only to state, that in common with many other members of this Society, I have repeatedly applied the fuming nitric acid in the manner described, not only in the presence of other practitioners, but also of a large class of pupils. In the majority of these cases the cervix and os internum had previously been so freely dilated as to permit the passage of the index finger up to the fundus, for the purpose of exploring the interior of the uterus. It is also commonly the practice in this city to apply the fuming nitric acid to the cavity of the uterus, after the removal of intra-uterine tumours, the cervix being sometimes so fully dilated as, in one of my own cases, to have permitted the extraction of a polypus as large as a turkey's egg. In all these cases the os was not only exposed to view by means of the duck-bill speculum, but the uterus was drawn down and firmly held by means of a vulsellum fixed in the anterior lip. Under such circumstances there can be no doubt but that the interior of the uterus was freely cauterized, that the uterine cavity remained was subsequently proved by examination and that it had been restored to health, was evinced not only by the fact that the distressing symptoms under which the patients laboured had been removed, but further and in an unequivocal manner by pregnancy having in some cases followed. It is needless to say more on this subject, except to express regret that a writer in a medical journal of high repute, should express decided opinions on subjects of which he is plainly ignorant. I have seen pelvic cellulitis follow the application of the liquor of the perchloride of iron to the cervical canal, but I have not ever seen an unpleasant symptom follow the use of the nitric acid.

In conclusion, to guard against misapprehension, I think it right to add that, in advocating this method of treating endo-

metritis, I must be understood to refer only to cases in which hæmorrhagia, purulent discharges, or profuse uterine leucorrhœa exist, or to cases in which other means have, on a full and fair trial, failed to effect a cure.

Dr. CHURCHILL said he rose to express his sense of the value of Dr. Atthill's paper. He believed that our recent knowledge of the pathology of the uterine cavity was the greatest advance that had been made of late years.

It would be within the recollection of many that he (Dr. C.) had read before this Society, and afterwards before the Melical Association, a paper on granular inflammation of the cervical canal. Since that time the use of the multiple tangle tents, for which he was indebted to Dr. Kidd, had enabled us to examine not only the cervical canal, by the endoscope, but the entire cavity of the uterus. In one such case at the Rotunda Hospital the rectum tube of the endoscope was passed to the fundus, and every portion of the cavity plainly seen. He had found general redness, or redness in patches, with or without the glistening granular appearance which he described as seen in the cervical canal.

He could bear testimony to the value of the free use of strong nitric acid. It neither gives pain, nor is followed by unpleasant consequences, perhaps because it does not make a deep slough. He had been using it freely for the cervical canal for a great many years, and for the entire cavity for some time.

Dr. RINGLAND said the Society was greatly indebted to Dr. Atthill for his able paper, in which he had given so full and complete a history of the symptoms and the treatment of this formidable disease. He thought the last observation he had made, in commenting on a review that appeared in a Medical Journal, on his (Dr. Atthill's) admirable papers on this subject, was a correct one, viz., that the review in question was the production of a gentleman commenting on a mode of treatment of which he had no experience. He fully endorsed what Dr. Atthill had said of the introduction of solid caustic into the cavity of the uterus. As to the application of nitric acid to the interior of the uterus, he was not aware until lately that Dr. Marian Sims had been in the habit of using it; in fact, he thought that he (Dr. Ringland) himself was the first to suggest the use of it. A paper was communicated some years ago to the Society by Dr. Kidd on the removal of intra-uterine polypi, and he detailed a case where they occurred again and again, necessitating frequent operations for their removal, and accompanied on each occasion with great hemorrhage. On

consultation he (Dr. Ringland) suggested the use of nitric acid in that case to check the growth. He had been in the habit of applying nitric acid to the cervix, and he had known of its application in the case of hemorrhoids, with the result of inducing a healthy action in the vessel itself. Seeing a large amount of hemorrhage in cases of cancer of the uterus, it seemed to him that the same thing might be applied there, and that solidification of the vessels of the uterus might be effected. The result proved that he was right. It struck him that hemorrhage in the cavity of the uterus, resulting from polypi or other causes, might be effectually controlled by the same means, and he suggested the application of nitric acid to Dr. Kidd and the late Dr. Beatty. They seized upon it, and he thought the paper read by Dr. Atthill showed that it was not altogether an unimportant or unwise suggestion.

Dr. J. A. Byrne, expressed his full approbation of the line of treatment Dr. Atthill had advocated. He thought it was one seldom attended with danger. Although nitric acid would appear at first to be a very severe remedy, yet after all, the wound it produced was a very superficial one, and the amount of suffering caused was not great. They knew this by its application to syphilitic ulcers; and it would appear that it did not produce a slough, but some alterative effect on the surface of the uterus. He fully concurred with Dr. Atthill, and joined him in condemning statements which, if not refuted, might have produced a very injurious effect in preventing the application of this valuable remedy.

Dr. Evory Kennedy took the same view as Dr. Byrne of nitric acid, namely, that it sounded more severe than it really was. It acted over a large extent of surface, did not go very deep, and produced a very healthy sore underneath. His attention was first called to it with a view of dealing with malignant disease, and he carried it out very largely, certainly before 1846. When he first made the application he was somewhat apprehensive as to what the result might be; but there never was hemorrhage, never any inflammatory action, and he never found any serious result from it. In some cases, especially those equivocal phagedenic cases, he had found it to act most satisfactorily, the result being that a healthy action was set up. He had used nitric acid in the interior of the uterus, and had never seen any unfavourable result. He did not believe the interior of the uterus took on adhesive inflammation, nor had he ever seen cellulitis produced as the result of the application of nitric acid.—*Dublin Journal of Medical Science, Jan.* 1873, *p.* 78.

73.—INDUCTION OF PREMATURE LABOUR.

By Walter Whitehead, Esq., Surgeon to St. Mary's Hospital for the Diseases of Women and Children, Manchester.

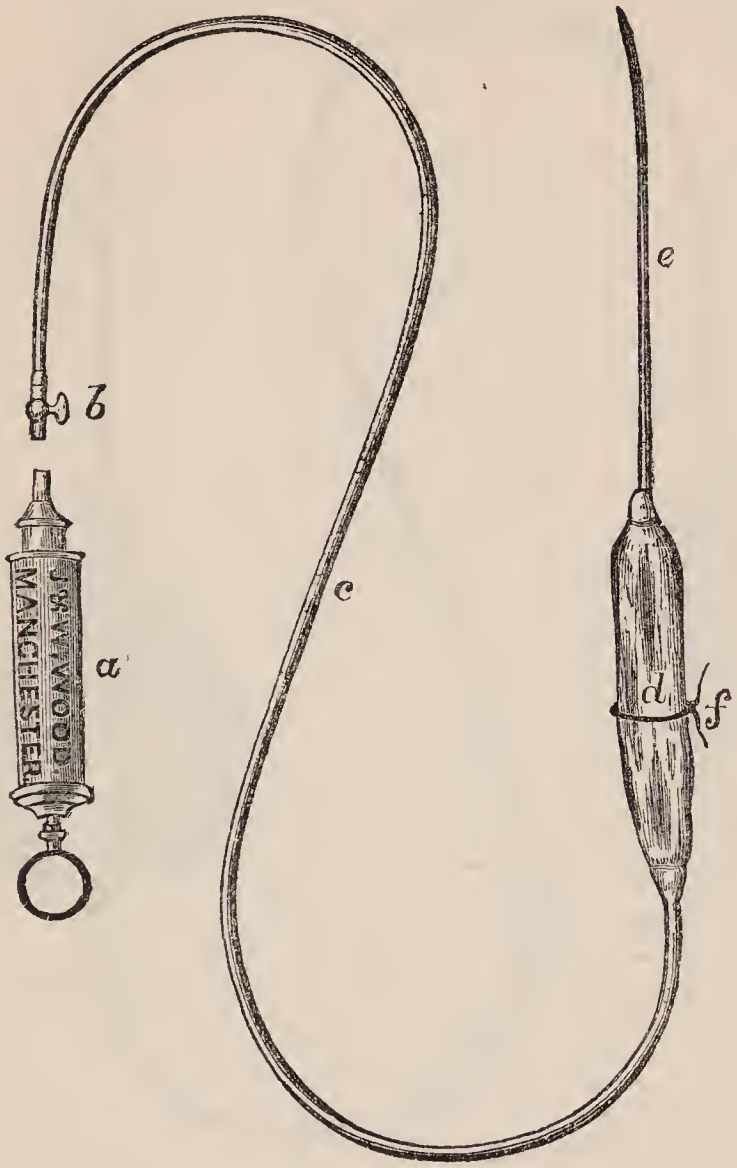
Of the numerous methods at our disposal for the induction of premature labour, the one advocated and introduced into practice by the distinguished author of "Lectures on Obstetric Operations," is the one now all but universally adopted by the profession, not only in this country, but on the continent. Dr. Barnes recommends the following procedure: first, overnight, pass an elastic bougie six or seven inches into the uterus, and coil up the remainder of the instrument in the vagina. Next morning some uterine action will have set in. In the afternoon, at an appointed time, proceed to dilate the cervix by means of hydrostatic bags, rupture the membranes, and then, either by leaving the rest to nature, by turning, by the forceps, or by craniotomy, complete delivery.

The success of this procedure depends upon the retention *in situ* of the bougie for a sufficient length of time to induce uterine contractions by detaching the membranes along its course, and upon the irritation it conveys to the fundus. The failures with this plan are almost invariably to be attributed to the bougie escaping from the uterus immediately after introduction, or at least before it has fulfilled its object. Dr. Barnes relies upon the coil he gives the bougie in the vagina, and I have twice done the same; but having on the last occasion had to repeat the operation, I decided with the next opportunity to attach the bougie to an air pessary, in the hope that by its combination I should be able to fulfil two objects—1. Keep the bougie in the uterus; 2. Dilate the vagina, and thus facilitate the ulterior stages of labour by acting as an additional excitant; and, moreover, expanding the channel through which the head is to pass.

Fig. 1 represents the instrument prepared ready for introduction. To render this more easy of execution, a piece of twine is tied round the centre of the collapsed pessary, which, on being inflated, assumes a balloon shape; and the ligature, in consequence, slips to the narrow end. The instrument can either be introduced through a speculum or without, just as the operator may think proper. When the pessary is inflated, as shown in *fig.* 2 (see page 270), the small tap at the end of the tubing is turned and made secure by means of a little sticking plaster, and then passed through an aperture made in the centre of a perineal bandage, which is to be worn attached to a second band passed round the loins. It is advisable before using the bougie to soften it, and there is no better plan of

doing this than by placing it for a few moments in warm water, and then anointing it with olive oil.

Fig 1.

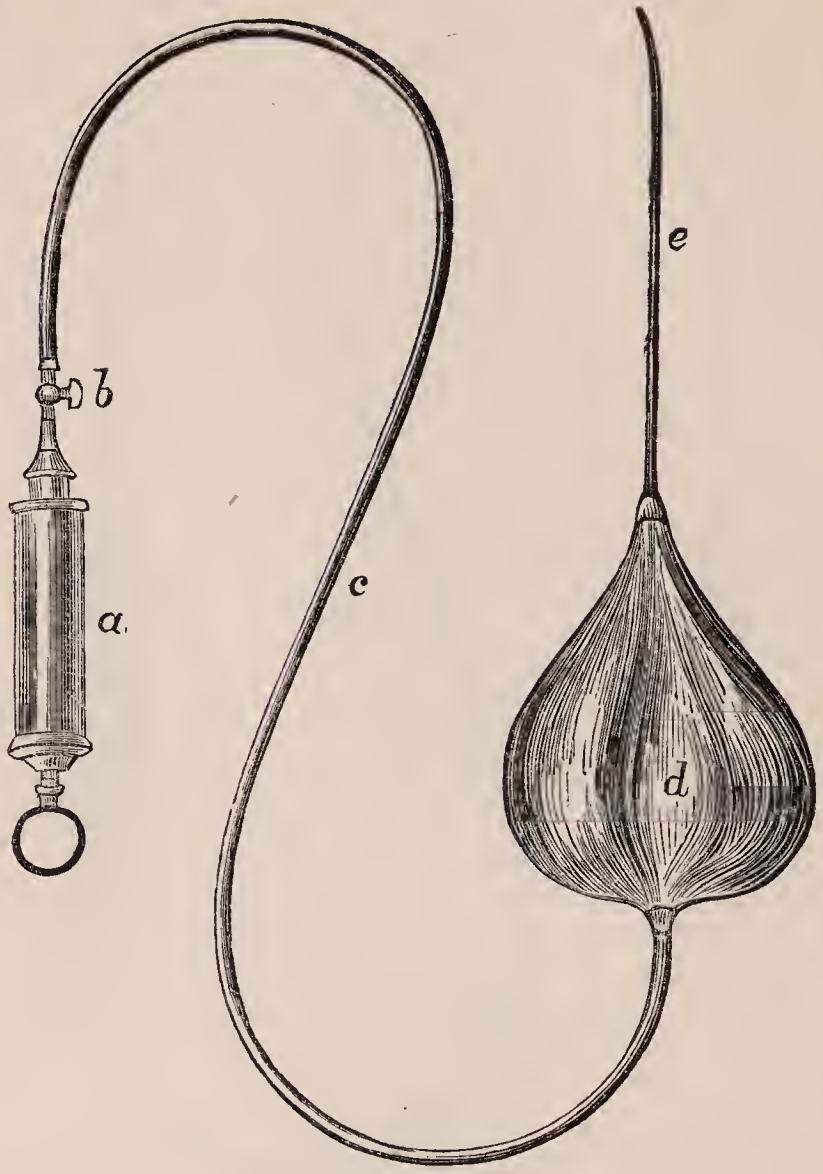


I have now used this safe and efficient plan of inducing premature labour six times; the more interesting details of the cases I append, not only as illustrative of the instrument I describe, but because I consider all such cases interesting in themselves, when we remember the number of deaths which formerly took place from the premature mechanical arrest of gestation.

Case 1.—M. H., æt. 33. She has been married nine years, and has had five children, all born dead at full term. Each confinement had been tedious, and all the children had either

been delivered by turning or forceps. I first saw her on the 14th of Dec., 1869, suffering from retention of urine which,

Fig 2.



upon examination, I found to depend upon retro-version of a pregnant uterus. After emptying the bladder, I restored the uterus to its normal position, and took the opportunity of ascertaining that there existed a pelvic deformity sufficient to account for the difficulties which were stated as having been experienced with the birth of each child. Taking all the circumstances of her case into consideration, I decided that arrangements should be made to induce premature labour, at the end of the eighth month. As she had ceased to menstruate for the last time August 14, 1869, I calculated, according to the formula of Barnes, from the day after the cessation, 230 days,

and allowing 20 days for a margin of safety, I fixed April 23, 1870, for her delivery; on the day previous, at 12.45 p.m., I introduced the bougie into the uterus, and on the following day a living male child was born at 3.45. Half an hour before the birth of the child I arrived, and found the os dilating; this I furthered by the use of the largest hydrostatic bag, and immediately proceeded to turn. She made a more rapid convalescence than she is stated to have done after any of her previous confinements.

Case 2.—G. E., æt. 24. Epileptic. Married seven years, and had had three children born dead, generally prematurely, and in each instance delivered by forceps. A month before her confinements she had invariably become dropsical, her feet, legs, and body swelling to most distressing dimensions. An estimate, with a pelvimeter, of the pelvic proportions, gave a conjugate of a little over 3·00″; hence I fixed, in accordance with the rule adopted in Case 1, May 25, 1870, to accomplish delivery. On the evening of the 24th, I introduced the bougie, and the following evening Mr. Runcorn, the resident obstetrician of St. Mary's Hospital, delivered a living female child.

Case 3.—E. T., æt. about 30. Married six years. She went to the full period with four children, and had to be delivered of them all by craniotomy. When next she became pregnant, I decided to bring on labour at seven months, and admitted her into St. Mary's Hospital with that object October 24, 1871. The same day I introduced the bougie at 11.15 a.m., and promised to visit her the next day about the same time, which promise I fulfilled, and at once commenced to dilate with the bags. In about fifteen minutes the os admitted the left hand, and, a knee being easily got hold of, I turned. Delivery was completed ten minutes afterwards. The child, a female, required the diligent exercise of artificial respiration before any evidence of life could be obtained; but eventually Mr. Runcorn, who had taken charge of the child, succeeded in exciting a cry, which was the earnest of a future vigorous existence. The pelvis was very much contracted, so much so, that no ordinary child at full term could possibly have been delivered alive. The mother and child subsequently did very well.

Case 4.—Mrs. F. æt. 29. The mother of one little girl, had also had two boys, delivered by forceps, dead. From the difficulties I experienced with the forceps in her last confinement, I decided, should she again become pregnant, that I would induce premature labour at the eighth month. On January 2, 1872, being the time fixed upon, I introduced the bougie, at 9.30 a.m. At ten next morning, I introduced the largest bag for five minutes, turned and delivered a puny boy, who required upwards of an hour's anxious care to establish con-

stant respiration. At three months of age the child was quite plump and strong.

Case 5.—M. A. B., æt. 35. Was admitted into St. Mary's Hospital on the recommendation of a medical man who had attended her in her last confinement, and who wrote, that in his opinion labour ought to be induced this time at the eighth month, as he had found the vagina cicatrised, and contracted to such an extent that the possibility of a living child being born was very remote. On February 8, 1872, I introduced the bougie, and expected to have found the uterus in a condition for delivery the next day, but, nothwithstanding the bougie having remained in position, no alteration had taken place. The instrument having been withdrawn, and a copious secretion syringed from the vagina, it was re-introduced, and another day allowed to pass. On the evening of the next day labour set in, and Mr. Runcorn delivered a dead child. I believe in this instance delivery could have been accomplished much earlier had the bags been used. I look upon the presence of the dilated pessary as having been useful in extending the contracted vagina; and, although the child was born dead, there was no evidence to show that death arose from compression.

These cases go to prove the truth of Dr. Barnes' remarks that "labour may always be completed with safety within twenty-four hours." I had a sixth and most interesting case, which was in St. Mary's Hospital in the early part of 1870, but having lost the notes of the case, I am unable to to give the details. She was paralysed, and suffered from extreme pelvic distortion. All her children had been delivered by craniotomy. I provoked labour at the seventh month, and perforated; thus saving the woman a further month of suffering and lessening the difficulties which would, as previously, have been experienced in effecting delivery.—*Liverpool and Manchester Medical and Surgical Reports*, 1873, *p.* 170.

74.—REMARKS ON A NEW MIDWIFERY FORCEPS.

By Dr. Francis Vacher, Birkenhead.

Since Chapman published a description and engraving of the instrument used by the Chamberlens, it has been so often altered and improved that a proposal to increase the armamentarium of the accoucheur by the addition to it of yet another modification of Dr. Paul Chamberlen's wonderful invention may well appear uncalled for.

In a recently published illustrated catalogue of surgeons' instruments, appliances, &c., issued by a well-known firm, I

find cuts of no less than thirty forms of midwifery forceps; and yet these are only a few selected instruments kept in stock by one London house, and represent a mere fraction of the number the ingenuity of the profession has devised. Indeed, perhaps, it is not beyond the truth to say, that of all those who, during the last one hundred and forty years, have taught and laboured to advance the science and art of obstetrics, nearly every one has left his name on a pair of forceps. With all this, the forceps now ordinarily in use in this country are essentially the same as the original instrument—improved, I grant, in shape and proportions, in lock and handles, but the same in principle, the same in practice; that is to say, a pair of vectes to be introduced separately, and then joined so that each may act as a fulcrum to the other. The old fixed pivot joint, commonly called the German lock, is now, in most instruments of British make, replaced by Chapman's lock, or Dr. Bond's modification of it. Smellie and Levret added a second curve, called by Mulder *curvatura nova*, and by Tyler Smith the pelvic curve, to distinguish it from the cranial curve. Smellie also increased the length of the shank, thus making the first long forceps, and substituted wooden handles for hooked iron ones. More recently, Sir James Simpson altered the shape of the handles, and added cross stops, to give additional traction power. Dr. Zeigler increased the width of the shank of one blade, and introduced a slot in it continuous with the fenestrum, for passing over the handle of the other blade, insuring apposition, and facilitating application. Whether Assilini's old-fashioned forceps, the blades of which do not cross, or Dr. Radford's asymmetrical device for grasping the fœtal head antero-posteriorly instead of laterally, and many other ingenious contrivances it is not necessary to particularize, can be justly called improvements on the most primitive forceps is at least doubtful. Some men have "invented" a new forceps for the sake of slightly altering the shape of the blades, some merely to vary the breadth of the blades or the size of the fenestra, some to increase or lessen the length of the handles, or the distance between the blades when the handles are in perfect apposition. In brief, I would submit, that with all the improvements which have been made in the instrument during nearly a century and a half, the forceps in the present day most used in Great Britain, which I take to be Denman's for the operation in the cavity of the pelvis, and Simpson's or Ramsbotham's for the high operation, do not differ strikingly from the Chamberlens' instrument. Simpson's and Ramsbotham's differ in four particulars; the blades have a second curve, the shanks are lengthened, the locks altered, and the handles modified. Each of these changes, considered alone, is

but slight, yet together they have so improved the practical utility of the instruments, that, as a long forceps, Sir James Simpson's is as near as possible all that can be desired. Denman's, inasmuch as it has wooden handles and Chapman's lock, is an improvement on the original instrument; and as Denman's, or forceps closely resembling his, is the form of short forceps commonly employed in this country, it is probably the best we have.

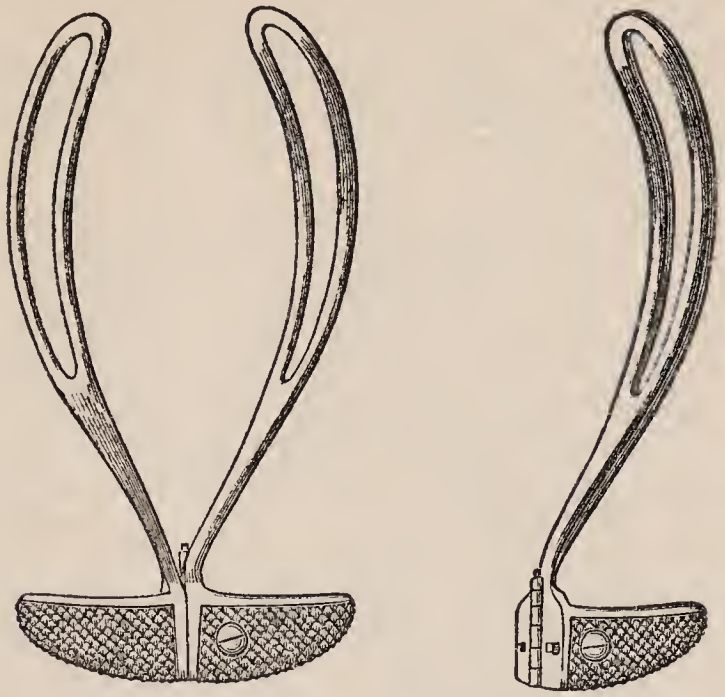
It cannot, however, be said of short forceps that it affords us the ready, simple, mechanical help we require when the fœtal head is well down in the pelvic cavity. It is as formidable an instrument as the long forceps, almost as difficult to apply; its use requires to be preceded by the same precautionary preparations—moving the patient to the bed edge, emptying the bladder and rectum, &c. The same tedious conference with the patient's friends has to be gone through, the same formal explanation of the operation and the necessity for it to the patient, the same unwillingness to be overcome, and the same alarm excited, as if instrumental delivery from the superior strait were contemplated. The short forceps, such as we now have it, is in truth the same instrument, except as regards size, as the long forceps, and patients and their friends naturally have as much dread of one as the other. Until it can be so modified as to be quite a different instrument from the long forceps, less formidable, easier of application, these fears of the patients and their friends must always weigh with the practitioner, and often induce him to delay assisting the descent of the head long after such delay is dangerous to mother and child, or to resort to ergot, which, if the labour be tedious from slight disproportion, is so apt to be fatal to the child.

Such a modification of the short forceps I think I have been so fortunate as to devise. It was constructed for me from my drawings, by Messrs. Weiss and Son, of London, in May last, and now that I have tested its utility, and find it has more than answered my most sanguine expectations, I bring it before the notice of the profession.

I have said that the ordinary short forceps (Denman's) is an improvement on the most primitive instrument only in respect of the lock and handles. My forceps, as will be seen by referring to the wood-cut differ from Denman's and from every other form of short forceps, both in lock and handles.

The instrument may be described as consisting of two blades or clams, essentially the same as those of ordinary short forceps, except that the lower blade is slightly shorter than the upper, being adapted to lie within it when the instrument is closed. At the lower extremity, or but, of each blade, bent at

an acute angle to its convex surface, is a handle, rounded off and slightly curved like a small horn. The handles are of black wood, but the bases, which are perfectly flat, are faced with steel, as are also the parts directed towards the blades,



the steel being continuous with the blades. Along one edge of the handles' bases, and extending into the shanks of the blades, is a stout hinge, and near the opposite edge is a strong steel snap. The measurements are :—

Length of the whole instrument, $8\frac{1}{4}$ in.
Interval between the blades at the widest part, $3\frac{1}{2}$ in.
Interval between the points of the blades, 2 in.
Greatest width of blades, $1\frac{5}{8}$ in.
Length of each fenestrum, $4\frac{1}{4}$ in.
Length of each handle, 2 in.
Depth " 1 "
Breadth " $\frac{3}{4}$ "
Length of hinge, $1\frac{5}{8}$ in.

The edges of the blades and fenestra are, of course, neatly bevelled off, and the upper or outer blade projects beyond the other sufficiently to prevent the possibility of the soft parts of the mother being caught. It should be mentioned also that the blades, when the instrument is closed, only lie perfectly close at the lower margin; along the whole length of the upper margin they are separated about an eighth of an inch—an arrangement necessary to enable the blades to pass one another.

The instrument is calculated, as are other short forceps, for delivery of the head when it is in the cavity of the pelvis, and when it has in great part emerged from the pelvic canal and rests on the perineum, and the circumstances which call for its use are the same as those demanding the application of the ordinary short forceps, that is to say, arrest of the head at the pelvic outlet, from inertia of the uterus, from slight disproportion, from mal-position, &c., or from any condition of the mother or child likely to peril either in the event of delivery not being completed.

The method of proceeding with the instrument is as follows:—The patient being presumed to be on her left side, with the thighs flexed upon the abdomen; the operator, having the forceps (closed and well warmed and oiled) in his right hand, introduces two fingers of his left hand through the ostium vaginæ. The ends of the blades are then slipped along the palmar surface of the fingers, conducted to the head, and, guided by the fingers as far as they will reach, passed between the head and the hollow of the sacrum, the blades' ends being made to hug the head all the way. The ends of the handles, which of course point directly towards the anus, are now slowly and carefully separated with both hands, until their bases are in exact apposition, when the instrument locks of itself. The index finger of the left hand may now be passed into the rectum, and the margins of the blades felt to the right and left, and those using the instrument for the first time might satisfy themselves of the position of the blades, when introduced, by this simple means. If the forceps has been skilfully applied, the handles, when locked, will be in a line with the transverse diameter of the pelvis. The two handles united are next grasped like a corkscrew handle, and traction applied in the ordinary way. When the head has been drawn down so far that a finger introduced into the rectum can hook on to the right or left supra-orbital arch and retain it in position, the forceps should be unlocked, folded, and carefully removed.

The old rules,—that forceps be introduced during an interval, great care taken that no soft parts or hair are included in the lock, and that traction be made during the pains, where there are any, and intermittingly like pains where there are none, and always in the direction of the axes of the pelvis,—I need hardly say should be borne in mind by anyone using my instrument, the same as if he were using another.

I have said delivery may be effected by the forceps I am writing of, (1) when the head is in the pelvic cavity, and (2) when it has in great part come through the outlet. In the second class of cases, the blades, when locked, will lie nearly

evenly over the ears, the parts usually grasped by ordinary short forceps. In the first class of cases the head will be caught obliquely, much as it would be at the brim by the long forceps, —that is to say, where the head is in the first position, the end of the upper blade of the forceps, when locked, will rest on the temporal ridge of the right side or half of the frontal bone, the lower blade end on the mastoid portion of the left temporal bone; and where the head is in the second position, the end of the upper blade will rest on the right mastoid, the lower on the ridge on the left half of the frontal. The third and fourth positions will generally have changed into the second and first by the time the head is wholly in the cavity.

I am aware there is nothing new in grasping the head obliquely when it is in the pelvic cavity. Though not the practice usually advised in text books, it has its advocates. Some practitioners apply the short forceps in this way as a rule, and others must needs do so occasionally when the caput succedaneum is so large that it is difficult, or impossible, to diagnose the position of the head with certainty, or where introduction of the blades in the oblique diameter of the pelvis, so as to clasp the head laterally, is impracticable. Neither do I claim there is anything new in passing a blade into the hollow of the sacrum and then bringing it into position,—it is recommended by no less an authority than Sir James Simpson, —nor in passing both blades together into the hollow of the sacrum and slipping them right and left,—it was suggested, upwards of three years ago, by Dr. Braithwaite, the editor of the well-known *Retrospect of Medicine*. I admit also that there is no novelty in short clubbed handles—Professor Inglis had such handles fitted to Simpson's blades, and called the "improvement" by his name.

I do not claim to have invented a new short forceps, nor to have discovered a new way of applying that instrument; but I do claim to have devised a lock more suitable for the short forceps than Chapman's, Ziegler's, or the German lock, or any modification of either of these, and a folding handle, like a corkscrew handle, meant for traction only. Both lock and handle are new so far as I know, and in respect of them the forceps is essentially new, and differs from the Chamberlens' instrument more than any short forceps yet contrived. That it is a perfect instrument I do not assert, but I am convinced the principle on which it is constructed is sound, and that in it we have the essentials of a more useful and perfect short forceps than any hitherto brought before the notice of the profession. In conclusion, I submit the following propositions regarding the instrument:—

1. That it is smaller, lighter, and more portable than any other form of forceps.

2. That it is altogether a different instrument to the long forceps, could not be confounded with it by a patient, and is as little likely to alarm the most timid as the whalebone fillet.

3. That it can be more easily and quickly applied than any other form of short forceps.

4. That it may be applied without subjecting the patient to the preparations considered necessary before using the ordinary forceps—placing her across the bed, bringing the hips to the bed edge, emptying the bladder, &c.

5. That it may be introduced, and the blades brought into position and locked, almost without the patient being conscious an instrument is being used, and certainly without the pain caused by the pressure on the vagina and labia required to keep the blade ends of the ordinary forceps in close contact with the head during introduction.

6. That it cannot fail to lock, and does so without the metallic clashing almost impossible to avoid when other instruments are used.

7. That it cannot slip.

8. That with it, as with no other forceps, traction is effected without compression. This I take to be a great advantage, for pressure on a child's head during delivery often brings on convulsions which may be fatal, sometimes paralyzes the portio dura, sometimes permanently impairs the brain and produces idiocy.

9. That the simple transverse handle is better adapted for traction, less cramping to the hand, less fatiguing to the operator than any other, not excepting the handles with short cross stops.

10. That it is a vectis no less than a pair of forceps, and when folded may be used as that instrument to assist the rotation of the head, correct mal-positions, and as a lever-tractor, the operator making a fulcrum of his left hand, and drawing with his right.—*Liverpool and Manchester Medical and Surgical Reports*, 1873, *p.* 77.

75.—ON CEPHALOTRIPSY.

By Dr. J. WALLACE, Assistant Obstetric Physician to the Liverpool Ladies' Charity and Lying-in Hospital.

Case 1.—Mrs. T., æt. 36, was taken in labour on Sept. 4, 1870. At the end of two days, as the labour made no progress, I was asked to see her by the midwife in charge. The patient was a dwarf, hardly three and a half feet in height, with broad shoulders and hips; and the lower extremities presented a remarkable appearance of shortening, from bend-

ing and twisting of the bones of both thigh and leg, caused by rickets. The contour of the abdomen was unusually prominent, the uterus lying forward and over the pelvic arch. She was in good spirits, and her general health was satisfactory, although for more than a year she had felt a difficulty in walking from weakness in the back. She was the mother of two living children, and had not previously required any assistance in labour. Osteo-malacia, and jutting forward of the sacral promontory as a consequence, probably accounted for the formation of the distorted bony passages. On examining per vaginam, I found the os uteri well dilated, its anterior lip somewhat œdematous, and the pelvic brim shaped in the form of the figure of eight, from bending forward of the sacro-vertebral angle, and bending backward of the horizontal rami and of the symphysis pubis. The antero-posterior or conjugate diameter measured about two and a half inches, while the transverse was normal. The pelvic malformation was therefore of the most common form met with. The bladder and bowel having been emptied, I applied the long forceps, but could not stir the head, which was lying transversely at the brim, and resting on the pubis. I then sent for the cephalotribe (Kidd's), a straight instrument, and asked my colleague, Mr. F. W. Lowndes, to assist me, but Mr. Wood, the then resident house surgeon of the Ladies' Charity, came instead. Having directed Mr. Wood to steady the uterus, I applied the straight forceps of Churchill, but they failed, equally with Simpson's. At this stage the maternal passages were cool and uninjured in any way, and I think this had a considerable bearing upon the result of the operation. As forceps had failed, and as there was every reason to believe the child was not alive,—there being no fœtal heart sound detectable, no movements had been felt by the mother during the last twenty-four hours, and the membranes had been ruptured all that time,—I determined at once to resort to cephalotripsy. I perforated the right parietal bone and applied the cephalotribe, crushing the fœtal head, vault and base, so completely as to enable me to finish the labour without any difficulty. The head was crushed and flattened. The patient did well, and was up and going about before a week had passed. I was much struck by the ease of this method of operating as compared with the old one of crotchet or cranioclasm. This was the first successful cephalotripsy which had been done in Liverpool. My next case was even more satisfactory, when the greater urgency of the symptoms and the less favourable condition of the patient are considered.

Case 2.—Mrs. K., æt. 17. August 13, 1872. She was taken in labour with her first child on the previous day, and was

under the care of an old woman, who left her suddenly when convulsions set in. The friends, then, with an order from the Ladies' Charity, got a midwife, at 4 a.m., who requested my immediate attendance. Mrs. K. was a cripple; her left knee-joint being ankylosed, with the leg bent at right angles to the thigh, and withered; the thigh of the same side not half so well developed as that of the other limb, and the hip-joint and pelvis correspondingly small. She was moreover almost or quite deaf, and the squint I had noticed as she lay in convulsions (eclampsia) was natural to her. I administered chloroform, and, on examination, found the os uteri well dilated, the head at the brim with a large caput succedaneum, and resting on the sacral promontory, which was jutting forward and narrowing the conjugate diameter by fully one inch and a half. The pelvis was small but equal laterally. I applied the long forceps (Simpson's) and brought down the head a little, after which it got completely locked and could not be moved farther downwards. I then determined on performing cephalotripsy, and sent for my colleague, Mr. F. W. Lowndes, while I went for the instrument—the midwife, in the meanwhile, keeping the patient under chloroform, thus completely controlling the convulsions. Mr. Lowndes tried the forceps, and I again put them on (not Simpson's, but Churchill's straight instrument); but it was impossible thus to forward delivery. I therefore perforated and applied the cephalotribe, crushing the vault, and base partly, and brought the head down to the outlet, where again it was arrested. I then re-applied the instrument and crushed the base completely and brought it down still further. when its progress was again arrested. The shoulders and chest now opposed delivery. I accordingly applied the cephalotribe over the left breast and right shoulder-blade and crushed very thoroughly, after which delivery was completed without any further difficulty. This was the first time this latest and the last modification of the Edinburgh instrument invented by Sir J. Y. Simpson was used; and I must here own that it did its work easily and well. The patient came out of the influence of chloroform and remained well for a time, but the convulsions again attacked her. Fifteen-grain doses of chloral, given every half hour, relieved her after she had taken a drachm and a half, and then she had no return of the convulsions. On the second day consciousness was complete, and she had emptied the bladder without help.

Now as regards *the operation;* the performance of which will appear to most accoucheurs formidable and dangerous, and most assuredly it will be so in the hands of the rash or inexpert. Hemming records 200 cases, of which 161 recovered and 39 died. Dr. Wm. Jones tabulated the cases in the Hos-

pital of the Clinique at Paris during the years 1857, 58, and 59, and out of a total of 24 operations 7 were fatal and 17 recovered; but in eight instances the contractions were below $2\frac{5}{8}$ inches, and five of these were fatal, whilst amongst those above $2\frac{5}{8}$ inches there were 14 successful operations out of 16. In craniotomy with the perforator and crotchet the mortality is about 1 in $5\frac{1}{2}$. I feel sure that cephalotripsy, skilfully performed at the proper stage of the labour, will very considerably reduce the maternal mortality, not only because of its superiority over the older operations, but, also perhaps, for the same reasons that craniotomy and crotchet in the hands of some accoucheurs are very much less fatal than in the hands of others. In doing the operation it is necessary,—

1st. To perforate. Some have objected to this as unnecessary, but the experiments of Nersent show that all the diameters except one are lengthened on an average seven-sixteenths of an inch when the cephalotribe is applied without previous perforation, but after perforation the increase was only from one-sixteenth to three-sixteenths of an inch.

2nd. Apply the blades of the cephalotribe in the same manner as the long forceps.

3rd. Grasp the fœtal head well forwards towards the pubis of the mother to crush the vault of the cranium, but towards the sacral promontory if the base of the skull is being crushed, and screw the handles together.

4th. Break up the head by repeated applications of the crushing power if necessary, and extract as if by long forceps. Nothing is to be gained by delay, as recommended by Pajot.

5th. Perforate and eviscerate thorax and abdomen if necessary, and crush the thorax and pelvis with the cephalotribe if extractive efforts fail. To do so thoroughly it may be requisite to decapitate, and afterwards to remove the crushed parts as they are brought within reach.—*Manchester and Liverpool Medical and Surgical Reports*, 1873, *p.* 149.

76.—ON THE TREATMENT OF CERTAIN FORMS OF MENORRHAGIA AND UTERINE HEMORRHAGE BY MEANS OF THE SPONGE TENT, WITH SPECIAL REFERENCE TO THEIR OCCURRENCE IN WOMEN RESIDING IN TROPICAL CLIMATES.

By Dr. George Granville Bantock, Physician to the Samaritan Free Hospital.

[We are accustomed to the use of sponge tents as a preliminary to other treatment of uterine disease, but in this paper the use of the sponge tent is itself the treatment recommended. The

author considers that it has a modifying influence upon the nutrition of the parts upon which it presses, controlling congestion and tendency to hemorrhage.]

Before proceeding, however, to record the cases which illustrate the subject I may be permitted to ask the question—What is a sponge tent? This may appear to many to be a trivial question, but I can assure them, if such there be, that it is an important one, and that much depends upon its right solution. There are at the present time, in the market, specimens, which, though in outward form they are very elegant, have no claim to the name of sponge tent except from the fact that they are seen to be made up of a piece, or pieces of sponge, and whose use tends only to bring discredit on the instrument. Not long ago I introduced one of these into the uterus of a patient and I took the precaution to retain it *in sitû* for several minutes, and to enjoin perfect quietude for an hour and a half. My injunctions as to rest were strictly obeyed, and water was freely used to ensure full dilatation. Nevertheless, twenty-four hours after, I had the mortification of finding that not only had the tent slipped into the vagina but that it was scarcely larger than when first introduced. In view of such a circumstance I may be excused for shortly entering on the subject of their manufacture.

In his original memoir on the "Detection and Treatment of Intra-uterine Polypi" (published at p. 122 of his collected works by Drs. Priestley and Storer) the late Sir J. Y. Simpson recommended that the sponge should be steeped in a solution of gum previous to compression; but the editors were careful to append a note to the effect that experience had proved this to be unnecessary. This appears to have been overlooked by subsequent writers; for Dr. Black, in the recently issued volume of the same author adheres strictly to the original memoir. Dr. Marion Sims, admirable though his directions in other respects are, commits, what appears to me a greater mistake in recommending that the sponge should be "thorougly saturated with a *thick* mucilage of gum arabic." I have used tents apparently made in this way and have as often been disappointed with the results. The tent, when fully dilated, presents somewhat the appearance of a lump of jelly; the gum forms a covering to the sponge and fills up the interspaces or canals, and this effectually prevents that action which is one of the principal objects, as will hereafter be explained. Good sound sponge of medium texture requires no addition of gum in the manufacture of tents of all sizes. The fine and close Turkey sponge, as well as the "honeycomb" sponge, is not suitable for the purpose, the former being deficient in resiliency and the latter in power. The only disadvan-

tage attending the use of sponge tents made in the way recommended, is the readiness with which they absorb moisture. This is best met by carefully selecting a tent that will readily enter the cervical canal, and in some cases, such as flexions and versions, by using a suitable speculum, and fixing the uterus by means of Sims' hook, and, if necessary straightening the organ. Whether a speculum be used or not it is necessary that the tent be covered with a thin coating of a mixture of wax and lard. I use the proportions of one of wax to three of lard. This coating should not cover more than half the sponge. Of late I have been in the habit of moistening the sponge, previous to compression, with a watery solution of carbolic acid one in twenty, and I am satisfied that it prevents, in a great measure, the very unpleasant smell which otherwise always attends the use of the sponge tent.

I have thought it quite unnecessary to describe the exact process of manufacture seeing that as it has been so graphically done both by Simpson and Sims, every one must be presumed to be acquainted with it.

I pass to the more immediate subject of this paper, viz., the treatment of certain forms of menorrhagia and uterine hemorhage by means of the sponge tent. The following cases illustrate the subject:

Case 1.—Mrs. C., æt. 30, mother of six children, was married at the age of 18, a year after her arrival in India. Four months after the birth of her second child she began to suffer from menorrhagia accompanied by great disturbance of the digestive system. She bore four children more, and the menorrhagia increased *pari passu*, so that at last she was compelled to leave the country. Several of her labours were accompanied by post-partum hemorrhage, especially the last. The periods recurred with tolerable regularity between the third and fourth week, but the quantity was so excessive that a fatal result was more than once apprehended. Ice and all the usual hæmostatic remedies were of no avail. She came home by the Cape of Good Hope in a sailing vessel, and such were the beneficial effects of the long sea voyage that the menorrhagia ceased. Not so the derangement of the digestive system. Soon after her return to this country, and after being for some time under the treatment of Sir James Simpson, she again became pregnant and was delivered at full term. The menorrhagia returned, and she was subjected to a variety of treatment both in Edinburgh and London; she had her cervix divided for supposed fibroid tumour, and was subjected to another operation at the same time. I had an opportunity of examining her almost immediately after the division of the cervix, and could find no trace of fibroid tumour, or even induration. The menorrhagia

was in no degree restrained by this operation, but, on the contrary, owing to the increased facility given to the escape of the blood, it was rather worse. The uterus was not larger than should have been expected in the case of a multipara, after a rather recent confinement; its texture was devoid of that solidity which is characteristic of its normal state, it was soft and flabby, the os and canal of the cervix were patent so as almost to admit the tip of the index finger: a No. 13 catheter —gum elastic—readily entered the cavity and fluid injected through it returned in full stream alongside. She came under my care in February, 1857, at which time—some months after the date of my first examination—the condition of the uterus was substantially the same as above described, and the menorrhagia no better. Her general health corresponded. She was in a state of great anæmia, unable to walk a very moderate distance without great fatigue and prostration, and rarely left the recumbent position. During the menstrual periods she was confined to bed, and the free use of stimulants was required to ward off a distressing feeling of faintness. I tried all the hæmostatic remedies such as iron, ergot, gallic acid, Indian hemp, &c., internally and locally, the cold douche by continuous stream (Sansom's douche), injection of sol. fer. perchl., &c. During this course of treatment she was seen by three of the most eminent obstetric physicians in London, at whose suggestion some of the above remedies, and in different forms, were administered. Still the menorrhagia went on. Residence at the sea-side produced very slight improvement in her general condition. Looking back at her history I suggested a sea voyage, but it was found impracticable. At last the idea occurred to me of trying the effect of a sponge tent. On her return to town from the sea-side, and on the 1st of October, 1867, I passed a large sized sponge tent, recently made as I have already directed, and rather more than two inches long, through the internal os, and left it for twenty-four hours. The next period showed a decided improvement. On November 28th I passed another: the result was still more satisfactory, all the former remedies were discontinued, the menstrual flow became reduced to a degree often exceeded by what is in some persons normal, and altogether she was so improved that she was able to return to India in the following October, having spent the preceding summer and autumn months in various parts of the country, without any treatment whatever. Previous to her departure she passed a fortnight in really hard work, purchasing, packing, &c. A few months after her return to India she again became pregnant, and was delivered at full term on May 18th, 1870. The menorrhagia returned, but not with its former severity. She is now in this country, having

come back in July of this year, 1871, although her menstrual periods are abundant they are not sufficiently so to require any treatment.

Case 2.—Mrs. W. came under my care as an out-patient at the Samaritan Free Hospital, suffering from excessive menstruation as well as intercurrent discharges of blood. She was the mother of several children, and until the commencement of her present symptoms had enjoyed good health. She had suffered from a slight increase of menstruation since the birth of her last child, between two and three years ago, but it was within the preceding few months that it had acquired its greatest severity, and that she had become the subject of intercurrent discharges. There was considerable leucorrhœa, chiefly vaginal. She had gradually—more rapidly of late—become weak and anæmic, and could hardly bear the walk from Lisson Grove to the hospital.

On examination the uterus was found to be slightly increased in volume: the cervix thickened but not indurated, the os patulous, its mucous membrane thickened, soft, spongy, and granular. The passing of the sound caused rather free bleeding. I administered iron alone and in combination with ergot, gallic acid, &c., but without any effect on the bleeding. Local remedies such as cold douche and astringent injections were of no use. After some hesitation I determined to try a sponge tent, and accordingly I introduced one of medium size and the patient returned home. Next day, with some degree of anxiety and apprehension of the result—as it was the first time I had attempted the treatment in out-patient practice—I visited the patient at her own home and removed the tent. It had acted extremely well—whether this was due to its containing no gum, or whether the copious sero-sanguinolent discharge set up had washed it all out I am not prepared to say—and held its place firmly, its meshes interlocking with the lining membrane of the cervical canal, and it was only by first passing the finger around the tent and successively pressing it away from the opposing surface that I was able to withdraw it. There was a very abundant watery discharge, excessively offensive: the vagina was immediately washed out with a solution of chlorate of potash (5 grs to oz.); she was ordered to keep her bed for a couple of days and to continue the tr.fer. perchl. which she was then taking. At the end of the week she presented herself at the hospital.

From that time the intercurrent hemorrhages ceased, her menstrual periods assumed normal proportions, and in a few weeks she was discharged. I met her accidentally some months after and she stated that she was quite well. More recently she has been again under my care, but for dyspeptic symptoms.

Case 3.—Mrs. T., æt. 24, a native of Calcutta of very dark complexion, from a considerable infusion of Indian blood, began to menstruate at the age of fourteen; the periods recurred very regularly every month, and lasted from six to eight days, the total amount of discharge being above the average, but unaccompanied by clots. She married at the age of seventeen, and two months afterwards had a miscarriage. Her next period assumed the character of menorrhagia with clots. Repeated miscarriages at varying intervals took place, amounting to a total of seven, the last occurring in September, 1868, at the fourth month, after a voyage to the Mauritius for the benefit of her health. During her pregnancies she always suffered from slight hemorrhages at irregular periods. From the date of her last miscarriage the menorrhagia was so severe as to compel her to keep her bed for the whole period of from five to seven days. On the first day she usually complained of rather severe pain in the "waist;" on the third and fourth days large clots passed; and at the end of the period she was in a state of great prostration, from which she had scarcely recovered before the next period was upon her. In addition to this she suffered from frequent attacks of pain of a sickening character in the lumbar region, during the intervals of menstruation, and these were usually accompanied by a more or less decidedly sanguineous discharge. She sought advice in various quarters and was subjected to a variety of treatment, local as well as general, but, deriving no benefit, and receiving no definite information as to the nature of her disease it was determined that she should seek advice in London. The opinions pronounced on her case were various, one of them being that she was the subject of a tumour; another was to the effect that she required an operation. The removal of the supposed tumour, or whatever condition required operation, was the cause of the long journey. She menstruated for the last time in India from the 26th to 31st March, 1871 (inclusive), passing many clots, and she was taken on board ship on 3rd April, per Suez Canal,—being then in a very weak state. There was a scanty discharge on the 20th and 21st April; and again on 15th May there was a slight "shew." On 25th May she landed in England. This patient came under my care on 10th June. She had not been unwell again but complained very much of the frequency and severity of the attacks of the pain above mentioned, but without discharge of any kind. Her general health was very good, having undergone great improvement on the voyage. She had experienced a similar result from her voyage to the Mauritius, but the improvement was only temporary. On that occasion, it should be noted, her pregnancy extended to the fourth month.

Diagnosis.—On external abdominal examination not even the suspicion of a tumour was aroused, but vaginal examination revealed the following condition:—The uterus was of normal size, both as measured by the sound, and by the combined external and internal manipulation; there was a slight anteflexion; the os was patent; the whole cervix soft and flabby; the mucous membrane of the anterior lip especially, felt as if loosened in its submucous connections. Before placing her under treatment, and after having explained the nature of her disease and the treatment I proposed, I recommended her to obtain the opinion of one skilled in the treatment of uterine disorders. Accordingly on the following day she accompanied me to Mr. Spencer Wells. The result was a perfect agreement as to the absence of any tumour and the presence of the condition described. Nor was there any difference on the question of operation, while we were agreed as to the treatment to be pursued.

Treatment.—On 12th June, a small sponge tent was introduced and left for twenty-four hours; another was introduced on the 19th and removed on the 20th, and on the latter day I prescribed 10-minim doses three times daily, of the tr. fer. mur. and extr. ergot liquid. The menses appeared on the 29th and lasted three days, moderate in amount and not preceded by pain. There were no clots, nor was she compelled to keep her bed. She was allowed to pass over a month without another tent, and on 23rd July the menses again appeared. The quantity was greater, and there were several small clots. On this occasion I gave her a few doses of gallic acid. On the 29th she was complaining of the old pain and was rather disheartened. For this I prescribed gr. $\frac{1}{2}$ extract of Indian hemp to be taken every four hours while the pain lasted, and to be had recourse to on each recurrence. On 2nd August I passed a small tent. and on the following day another of larger size. Neither of these acted well as they were saturated with thick gum. On the 9th I introduced another of medium size, of same make, and next day had the mortification of finding it in the vagina little changed. However, I replaced it by another, and this by a third on the 11th, and the result was satisfactory. (These latter tents were made by myself for the occasion, and the sponge was merely moistened with the solution of carbolic acid. They were quite devoid of unpleasant smell on extraction.) To make sure work (as the patient limited me to time), I introduced another on the 16th. This acted perfectly, opening the cervix well. After the use of the sponge tents the vagina was washed out daily with a solution of ten grains of tannin in two ounces of water. The menses appeared on the 23rd and lasted three whole days; the discharge was

moderate, and the patient was not confined to bed at all. From this time she ceased to complain of pain. On September 21st she again became unwell, and the discharge ceased on the fourth day. During the whole of this menstrual period she went about sight-seeing daily without inconvenience of any kind.

Result.—On the 10th October she sailed for Calcutta in a state of perfect health, rejoicing as much at the cessation of the attacks of pain as of the menorrhagia. During the last month all treatment, local and general, was suspended.

Remarks.—These three cases are good examples of that form of uterine hemorrhage and menorrhagia to which I have desired to call attention, which is not described definitely in our text-books, and in the treatment of which the sponge tent is so valuable. There is no tumour, no fibroid thickening or induration, nor is there a polypus. The condition is one of relaxation of the tissues of the uterine body to some extent, but especially of the mucous membrane lining the cervical canal, and probably that of the uterine cavity—if I may be allowed to adhere to the established nomenclature for the sake of convenience, without prejudice to the question whether it be a distinct membrane or a layer of soft tissue. This state of relaxation permits congestion or stasis of blood to take place in the vessels of the submucous tissue (or layer of soft tissue), which, deprived of their necessary support, readily pour out their contents either under the influence of the menstrual molimen, or any influence acting locally or generally, and leading to congestion of the pelvic organs in their entirety, as occurs in the somewhat analogous case of hemorrhoids. In all the cases which have come under my notice the patients have either resided in India, and have been more or less liable to miscarriages or post-partum hemorrhages, or they have been resident in this country and have dated their illness from a miscarriage or delivery at term. These are not cases of sub-involution. I refer more particularly to the cases of residents in tropical climates (the term is not once mentioned by Dr. Tilt in his special chapter, to which I shall have occasion to refer more at length); for in Case 1 the uterus is described as being in no degree larger than is usual in women who have borne half a dozen children, while in Case 3 the size of the organ could be so easily measured by the combined external and internal manipulation, and the estimate thus formed was so exactly confirmed by the use of the sound that the idea of subinvolution could not be entertained. To the naked eye, when seen through the speculum, the everted mucous membrane of the cervical canal is seen to a much greater extent than usual, and its redness tends to lividity. Pressed with

the sound or any hard substance, the tissues yield to a greater degree than in their normal state, and the passing of the sound often draws blood. As a rule there is decided leucorrhœa—in Cases 1 and 3 it was not abundant—but I have never seen the os and cervical canal blocked up with glairy mucus, so characteristic of the so-called "catarrh" and inflammatory conditions of the uterus. Nor is there any increase of temperature. When examined by the finger the mucous membrane can be felt to slip over the subjacent tissues as if too loose. In Case 3 this was so well marked as to lead to considerable increase in the size of the anterior lip; and the disappearance of this condition was coincident with the cessation of the menorrhagia. *Obstetrical Transactions, vol.* xiv., *p.* 84.

77.—THE SUBCUTANEOUS INJECTION OF EXTRACT OF SECALE CORNUTUM UPON FIBRO-MYOMA OF THE UTERUS.

Prof. Hildebrandt, of Königsburg, has recently been experimenting on this agent in certain diseases of the uterus. His first case was that of a woman aged 33, who was suffering from a fibro-myoma of the uterus, and who had profuse menstruation (though this occurred but once a month), followed by very abundant fluor albus, and accompanied by severe uterine pains and spasms, with a feeling of weight in the abdomen. These symptoms she had experienced for three years. The tumour had attained such a magnitude that the uterus appeared equal in size to that of a woman in the twenty-eighth week of pregnancy. Many remedies had already been tried, as iodine, both internally and externally, ergot, perchloride of iron and lead. Compressed sponges and laminaria had been used to dilate the orifice of the uterus, and to render the tumour accessible to surgical interference; but these measures had to be given up on account of the great tenderness of the os uteri.

Prof. Hildebrandt now determined to try the effects of the daily subcutaneous injection for fifteen days, into the walls of the abdomen, of three grains of the watery extract of ergot in glycerine. Menstruation was induced, but the quantity was materially diminished. The tumour now began to diminish, and five weeks after the commencement of the injection had entirely disappeared. The sound could be introduced to its normal extent, the fluor albus and pain were abolished, and menstruation was rendered regular. After this singularly successful result, Prof. Hildebrandt adopted it in nine other cases of uterine fibroids, and found it successful in all but two. In one of these the use of the remedy had to be given up, owing

to toxic effects, and in the other on account of the extreme pain accompanying the subcutaneous injection. He recommends the employment of the ergot in solution in glycerine rather than, as Lagenbeck proposes, in alcohol, on account of the less pain occasioned by the former solution, and he finds the most convenient part to be the vicinity of the umbilicus rather than the inferior part of the abdomen, on account of its lower degree of sensibility. To prevent the escape of the fluid from the wound after it has been injected, he recommends that the orifice should be touched with collodion, and a pad of cotton-wool applied.—*Practitioner*, *Dec.* 1872, *p.* 380.

78.—ON JUNOD'S BOOT AS A REMEDY IN SOME FORMS OF AMENORRHŒA.

By Elizabeth Garrett-Anderson, M.D.

The difficulty often found in restoring the menstrual flow when it has been suddenly suppressed by cold or nervous shock is sufficiently well known to render it needless to apologise for mentioning a new or unfamiliar remedy. It is notorious that all drugs supposed to be emmenagogue in character are apt to fail when but for the absence of the catamenia the patient would appear healthy. The most trustworthy of the group, iron, probably fails far more often than it succeeds when given in the absence of symptoms of anæmia, and as a rule anæmic symptoms are not present when menstruation has been suddenly and as it were violently suppressed. These are, moreover, precisely the cases in which remedial measures are most urgently needed. In the more common forms of amenorrhœa, where the condition appears to depend upon immaturity, change of air, anæmia, phthisis, or general debility, the suffering directly due to the absence or irregularity of the menstrual loss is generally very slight, and the remedies, when any are needed, can be allowed to act slowly. In the sudden suppression of menstruation from cold or nervous shock, the case is very different. All the symptoms are urgent. The headache is violent, the face is flushed, the eyes congested, the pain in the back severe and the general excitement great. The physician who might treat this condition on the expectant method would probably have few opportunities of doing so twice on the same patient. But the remedies at disposal are lamentably uncertain. Several of the best on the list, such as hot hip and foot baths, mustard baths, hot whiskey toddy, hot bottles to the feet, pennyroyal tea, and colocynth pills, are usually applied without medical advice. The external application of leeches, though less uncertain than most remedies of its class,

often fails. Leeches applied internally, nitrate of silver to the os and cervix uteri, galvanic intra-uterine pessaries, and other direct stimulants to the interior of the uterine cavity, are inadmissible in the case of young unmarried women, for whom even stimulating vaginal injections would be ordered with considerable reluctance.

It is in cases of this kind, where the more ordinary and semi-domestic remedies have failed, where the distress from cerebral congestion is great, and where the suppression of menstruation has been sudden and has appeared to be due to some external or non-constitutional cause, that Junod's apparatus appears to me to promise to be of use, either as a palliative or as a cure. Essentially it is a dry-cupping on a large scale. The leg is enclosed in an air-tight case, and the air exhausted over it. The result is, that for the time the capillaries and vessels of the leg enlarge, more blood remains in the limb, and the circulation in other parts is proportionately relieved. It has the great merits of not interfering with other treatment, of being quite painless and so easily regulated as to be practically harmless, and of being applicable to young girls. I have tried it in two cases, and in each the return of the menstrual flow appeared to be the result.

In both cases the suppression dated from a violent chill during the catamenial period. In the first, the menstrual molimen was not very severe, but there was more or less constant headache and great depression and restlessness. There was no anæmia, and all ordinary remedies had been skilfully and actively applied under medical advice for some months before I saw the patient. The first remedy I tried was faradisation, placing one pole over the lumbar vertebræ, and varying the position of the other over the ovarian and uterine regions. I also extemporised an arrangement by which it was possible to apply the poles directly to the vaginal surface of the cervix uteri without using a speculum. After each application the patient said she felt for some hours as if the loss would shortly begin, but we were always disappointed. My patience failed after about six or eight trials, and I resolved to see the effect of Junod's boot at the next monthly period. After it had been applied twice, each time for about forty minutes, the flow appeared, and it has since returned regularly. Even after the first application the headache was relieved, and the general aspect of the patient unmistakably improved.

The second case was marked by much greater urgency in the symptoms. The suppression had occurred suddenly two months before I was consulted, and both at the time of the suppression and during the next succeeding period of molimen all the usual remedies had, I was told, been actively applied by the family

doctor in the country. When I saw the patient the headache was severe, the skin hot, and the pulse quick and feverish. Very hot sitz baths, with cold lotions to the head, a small blister to the neck, and two leeches on the thighs, relieved the headache, but did not bring on the flow. The next day, faradisation, and an ammoniated vaginal injection and more hot baths were tried, without effect. Two days afterwards the headache returned to an intense degree. I then applied Junod's boot; and while it was on, the face became less flushed, the dull, pained, oppressed expression lightened, and the patient declared herself better. The application lasted forty-five minutes. The leg was considerably swollen at its close, but the patient comparatively comfortable. The catamenia appeared the same evening. It is of course impossible to say how much, if any, of these results was due to the cupping process.

It is quite possible that the credit ought to be given to some one of the other remedies, or to all of them, or to none. Where the suffering of the patient is urgent, the desire to remove it naturally outweighs any leaning one would otherwise feel towards making a trustworthy therapeutical experiment.—*Practitioner*, *Dec.* 1872, *p.* 359.

79.—ON THE ESSENTIAL CAUSE OF DYSMENORRHŒA, AS ILLUSTRATED BY CASES OF PARTIAL AND COMPLETE RETENTION.

By Dr. Robert Barnes, Obstetric Physician to St. Thomas's Hospital, Examiner in Obstetric Medicine to the University of London and the Royal College of Surgeons.

[Not many years ago dysmenorrhœa was almost universally regarded as a purely nervous affection. More accurate methods of investigation have, however, shown that it is associated with distinct morbid conditions of the uterus. There is still a great divergence of opinion upon the subject.]

If we postpone theory and carefully analyse a large number of cases, noting the complications and the effects of treatment, we shall find that the cases of "irritable uterus" resolve themselves into the following groups, namely—1, in which there is manifest enlargement from congestion of the uterus; 2, in which there is subinvolution with chronic inflammation of the uterus following labour or abortion; 3, reclination or flexion of the uterus, most frequently retroflexion; 4, a projecting conical vaginal-portion, with very small os externum uteri; 5, disorder of distant organs, attended or not by one or more of

the preceding structural faults, and almost always with impaired sanguification and nutrition; 6, a morbid condition of the ovaries; and lastly, a residuum of cases in which, whether from not pushing investigation to the proper point to discover the associated fault, or because there really is no physical fault, we are obliged to conclude that the dysmenorrhœa is simply the expression of nervous disorder. We may reasonably expect that advancing knowledge of uterine and ovarian pathology will still further diminish this residuum.

I think observation warrants this general conclusion:—The healthy well-formed uterus is rarely an "irritable uterus" or associated with dysmenorrhœa. Or the case may be stated as follows:—For menstruation to occur healthily and easily, the genital canal, from its commencement at the fimbriated extremity of the Fallopian tubes to the vulva, must be freely pervious. In the course of this canal there are three natural constrictions, namely, at the os uterinum of the Fallopian tube on either side, at the os internum uteri, and at the os externum uteri. It is at these points especially that difficulty is apt to arise. But if extreme narrowing occur at any other part of the canal, as in the vagina, similar results will follow. If the closure be complete, and menstruation takes place, of course there will be retention. If the closure be incomplete there will be partial retention, the expression of which is dysmenorrhœa. This partial retention and dysmenorrhœa we know is extremely common. Its phenomena should, I think, be studied in connection with those of complete retention. We shall find in this study endless illustrations of the proposition that one essential condition of dysmenorrhœa is *retention of menstrual secretion*. There is another condition to which retention of secreted matter is not necessary. In many cases where there is congestion of the uterus combined with extreme nervous susceptibility, the pain is most marked at the onset of the period, that is, in all probability, before any pouring forth of blood into the uterine cavity has taken place. The pain is explained by the sudden distension of the morbid uterine tissue by the gathering of blood in the vessels preliminary to secretion. A close analysis will, however, resolve these cases also into the same class as the first. In both there is retention, the difference being that in the one case the menstrual blood is retained in the cavity of the uterus after secretion, and that in the other case the blood is retained in the tissues of the uterus. The point which brings both cases together is that there is difficult excretion, causing distension of the uterine fibre and nervous irritation.

The residual cases, which do not fall under the one or the other descriptions of retention, are rare indeed.

[Dr Barned then related numerous cases in illustration of his opinions, but in the discussion which followed several eminent practitioners dissented from him.]

Dr. PLAYFAIR said that every one would willingly admit the great value of the paper which Dr. Barnes had read, and the interest of many of the cases he had brought forward. The view which he so strongly advocated had been equally strongly upheld by Bernutz and Goupil, and other writers. It would, no doubt, be very satisfactory if we could explain the suffering connected with dysmenorrhœa by the presence of one condition alone. It would unquestionably greatly simplify our study of the affection. Unfortunately, however, it appeared to him that clinical facts were not in accordance with a theory so seductive from its simplicity. He had no wish whatever to throw the least doubt upon the mechanical theory as explanatory of a large number of cases. On the contrary, he believed it to be a very frequent cause indeed, and an important one. Many of the cases Dr Barnes had brought forward conclusively proved this. But then several of these were of quite an exceptional character, such as only come under the observation of a practitioner of his great experience. Others, such as flexions of the uterus, fibroids, &c., are, no doubt, active causes of the painful menstruation, and can only be remedied by the removal of the obstructing cause. But besides these he was inclined to think that there are a far larger number of cases than Dr. Barnes allowed where nothing of the kind can be found. Take for example those, so frequently met with, which have been classed under the head of congestive dysmenorrhœa. Here the pain is entirely or chiefly felt before the menstrual secretion is established; the moment that comes on the bleeding relieves the congestion and the pain vanishes. Clearly there can be no menstrual retention in the ordinary sense here, but even these cases Dr. Barnes refers to the same category by an hypothesis which, to say the least of it, seems a very remarkable one. He says these cases resolve themselves into the same class as the others, "the difference being that in the one case the menstrual blood is retained in the cavity of the uterus after secretion, and that in the other case the blood is retained in the tissues of the uterus." But surely there is all the difference in the world between pain which results from the efforts of the uterus to expel what is practically a foreign body in its cavity, and pain which results from the presence of an undue amount of blood in the vessels of the organ? Pain of the latter class is common, not only in the uterus, but all over the body, and it is just such a condition that produces the pain of a gum boil or some similar affection, and here, as elsewhere, the pain is relieved as soon as loss of blood relieves the loaded vessels.

No doubt, in the large majority of these cases there is some local condition of the uterus which explains the congestion, and which should be carefully searched for, such as chronic inflammatory condition of the uterus or a morbid state of its lining membrane. It is because these exist that the congestion of the menstrual nisus produces pain, which it should not do in a healthy state of the uterine structures. It should be noted, too, that in many of these cases the cervical canal is found to be morbidly patulous rather than constricted. Then there is a class of cases of some importance to which Dr. Barnes makes no allusion, which may be described in cases of ovarian dysmenorrhœa. In these the pain has probably nothing to do with the uterus at all, but would seem to depend on the changes going on in the ovary in connection with maturation of the Graafian follicle, and the discharge of the ovum. In these the pain is more or less distinctly referable to the site of the ovary, and not infrequently the enlarged and tender ovary can be felt on vaginal examination immediately before, after, or during the menstrual period. While, therefore, fully admitting the importance of mechanical causes of dysmenorrhœa, he believed that we should be taking a more philosophical and correct view of the affection if we did not try to force our explanation of them too rigidly into one groove.

Dr. Snow Beck quite agreed with the remark that this paper was founded on erroneous principles, which, if adopted, would lead to improper practice, especially in the virgin. Pain, or increased pain, at the menstrual period—dysmenorrhœa as it was termed—was an attendant on most of the diseases of the uterine organs, and one of the distressing ailments, often a most troublesome one, from which the female frequently sought relief. It would be impossible to go over, at the present time, the various diseases which induce this pain, many of which had little relation to each other. But it might be stated broadly that it was induced by any defect in the menstrual secretion, either congenital or acquired, or by any alteration of the uterine organs from a condition of health, either congestive, inflammatory or structural. Not unfrequently it arose from deficient development of the uterine organs, apart from any mechanical obstruction to the menstrual flow, and sometimes appeared to depend upon an unusual nervous susceptibility of the individual. No doubt it every now and then was caused by a mechanical obstruction to the menstrual flow, whether this arose from congenital defect, or from an acquired alteration, the result of some previous disease. But these were only exceptional cases when compared with the frequency with which it was met with as a symptom of other diseases. The idea of this mechanical obstruction was a very seductive one;

had been frequently taken up by different observers, and as frequently dropped after further experience as being a very inadequate explanation. He was unable to understand the statement that when the obstruction did not occur in the natural cavities of the organ it was caused by obstruction in the tissues. Dr. Barnes did not mention the particular types or tissues in which this supposed obstruction occurred, or the changes in these tissues by which it was accomplished. It was, he suspected, one of those imaginary statements too often indulged in and made without any sufficient foundation in ascertained facts. Some of the classes of cases met with in every-day experience were alluded to to show that in most of them there was no clinically observed facts sufficient to justify the statement that obstruction was "essentially" the cause of this pain. The case mentioned by Dr. Barnes, where a lady, after her confinement, complained of pain during menstruation, and on examination the sound passed 3½ inches, did not afford any evidence of obstruction. Since attention had been directed to these cases they were found to be of too frequent occurrence. The whole of the uterus remained enlarged, the external orifice often so patent as to admit the end of the finger; the cavity of the neck was large; the sound readily passed the internal orifice, and, by the freedom of the motion allowed, evidently entered an enlarged cavity in the body. The vagina also was generally large and ample, and the menstrual flow came away freely and without the least evidence of any coagula, yet was attended with great pain. No doubt, in many of these cases, there was a bending of the uterus forwards or backwards, but the attending pain was not greater in those cases than in others where the organ was found to be straight. Sometimes relief was afforded by passing the sound through the internal orifice, which was followed by the escape of a small amount of blood; but where this proceeding succeeded once it failed in the large majority, and was often so painful that the women after a few trials declined to have it further repeated. Again, these enlargements of the uterus were every now and then met with where the menstruation appeared naturally, and without any increase in the usual inconvenience; and the absence or presence of the attending pain appeared to depend upon the condition of the blood-vessels. In the examples where the pain was increased all the vessels were enlarged; the arteries, the veins and the capillaries, and the organs were greatly congested; where there was little attending pain the enlargement of the organs existed without the accompanying congestion. He suspected it was these latter cases which had been described as fibroid enlargement of the whole of the uterus. In other cases met with in the virgin

and in women who had borne children the pain and accompanying distress was more intense. The condition of the organs was also different. The great enlargement was not present; but the organs, sometimes both the vagina and the uterus, were hot, very sensitive to pressure; the introduction of the sound into the uterine cavity caused severe pain, and the arteries pulsated strongly and quickly under the fingers of the observer. Whether the condition was called chronic inflammation, active congestion, or whatever term, it appeared pretty evident that the severe pain during menstruation was produced by the increased congestion attending the menstrual function; much in the same way as the increased pain induced in an inflamed part whenever it was allowed to remain in a descending position; and this explanation appeared to be confirmed by the relief afforded by the local abstraction of blood, whether by the application of leeches or by scarification. In another class of cases, by no means unfrequent, and met with in the virgin as well as in the married female, the pain arose from irritation, or chronic inflammation, of the vagina, where obstruction was totally out of the question. In these cases the pain came on two, three, or four days previous to, and ceased, or was much relieved, on the appearance of the menstrual flow, was of a constricting character, attended with shooting pains up the vagina and bearing-down feelings, the pain being seated deep in the hypogastrium, in the groins and lower part of the back. He was aware that those cases were usually described as of ovarian origin, but was convinced that this error arose from want of careful observation. That these symptoms arose from affections of the vagina was well shown in the case of a young lady, which proved fatal, and was published by the late Mr. Obré, in the British Medical Journal for 1857. In another class of cases this vaginal irritation or congestion appeared to depend upon great constipation of the bowels, and was often met with in the virgin. Pain in the head, want of appetite, distress after taking food, and general languor were the attending symptoms, when on inquiry the bowels were found much constipated, being relieved once or twice a week and insufficiently. Gradually pain came on at each menstrual period, deep in the hypogastrium and lower part of the back, with shooting pains and bearing down. All of which symptoms passed away after a time when free and regular evacuations of the bowels were obtained, aided by cold and soothing vaginal injections. It was in these cases that guaiacum, which had been long recommended for painful menstruation, appeared to be of much service. Again considerable congestion of the rectum accompanied with hemorrhoids, but without any noticeable affection of the uterus, was attended with great pain

during each menstrual period, which appeared to be induced by the increased congestion of the pelvic veins accompanying the menstrual period. In fact, nearly all acquired, as distinct from congenital, alterations of the uterine organs from a state of health was attended with more or less increased pain during menstruation, and some affections of the neighbouring organs give rise to a similar increase of pain. The subject of 'The Irritable Uterus' was too long and too complicated to be considered at the present time. In conclusion, he had no hesitation in expressing his belief that obstruction to the exit of the menstrual flow formed but a small proportion of the cases attended with increase of pain during menstruation, and that the treatment directed "essentially" to this object would in the large majority of instances be attended with unfavourable results.

Dr. Rogers said that he must dissent from the conclusion, as far as he understood it, which the author of this most excellent and practical paper appeared to have arrived at, and must agree with the opinion of the preceding speakers that dysmenorrhœa was not a disorder depending solely on obstructive causes. Those who, like himself, had been in the practice of their profession over five and twenty years, and before the theory of obstruction was acknowledged and taught to be a cause of this affection, must have cured undoubted cases of dysmenorrhœa, and have known such cases cured in the practice of others. He had been for years physician to the Samaritan Hospital, where at an early period obstruction was recognised to be an important cause of dysmenorrhœa, and several of his colleagues have even invented instruments for operative treatment of such cases, and he had on many occasions used these instruments when other means have failed, and the case required it; and he had operated in similar cases to those brought before the Society by Dr. Barnes. In his opinion many cases occur from other causes, such as ovarian, rectal, or pure neuralgic disorders. It may be remembered by the Fellows that his colleague, Dr. Routh, had read papers before the Society with cases on a form of dysmenorrhœa arising from what he called fundal endometritis, where every care had been taken to eliminate all obstructive cause, and yet the dysmenorrhœa persisted.

Dr. Tilt thought the author had failed to make good his assumption that dysmenorrhœa was always caused by the retention of the menses in the uterine cavity, and Dr. Tilt thought it was unjustifiable to give cases of menstrual retention by vaginal occlusion as illustrative of dysmenorrhœa. He thought the most frequent cases of obstructive dysmenorrhœa were those in which the obstruction was clearly spasmodic;

cases in which dark blood and blood clot were passed after two or three belladonna-and-opium suppositories had been introduced into the rectum; the cervical canal freely admitting the uterine sounds forty-eight hours after menstruation. He said he had repeatedly met with cases in which dysmenorrhœa was intense, although the cervical canal was perfectly free, the discharge of a florid colour and without clots. The dysmenorrhœa in those cases sometimes depended on chronic inflammation of the menstruating surface, sometimes on morbid ovulation and subacute ovaritis; whereas, in exceptional cases, the complaint would only be considered as a neuralgia of the menstruating womb.

Mr. SPENCER WELLS believed that a very large proportion of cases of true dysmenorrhœa depended upon mechanical impediment to the free escape of the menstrual fluid, and are curable by removal of the obstruction. Sympathetic pains in the breast, or elsewhere, and nervous symptoms common at the menstrual period should not be confounded with true dysmenorrhœa. He had narrated cases in which severe obstructive dysmenorrhœa had been cured by replacement of the flexed uterus, by dilatation of the cervical canal, and by opening a closed vagina. In the last case careful inspection is much safer than using a trocar.

Dr. BARNES, in reply, thanked the speakers for their criticism, which would be exceedingly useful to him. There was no time left to answer each in detail. The criticisms with which he had been favoured had excited in him some surprise. He had anticipated rather being found fault with for bringing before the Society propositions too trite, and which no one disputed. He had not expected to hear so many expressions of dissent. The general tenor of the observations made was to attribute to him a more absolute reference of cases of dysmenorrhœa to retention as the cause than the paper justified. He admitted that there were other causes; he had expressly cited ovarian conditions; but he could not assent to the conclusion that because in many cases of dysmenorrhœa pain was referred to the region of the ovaries, the cause in these cases was necessarily due primarily to ovarian diseases. It was just to remember that Henry Bennet long ago pointed out that ovarian pain was symptomatic of inflammatory condition of the uterus. It was also symptomatic of other diseases of the uterus. When these diseases were cured the ovarian pain vanished. Dr. Playfair missed the true application of the cases of complete atresia to the question under discussion. Certainly they were rare, but such a case as the one of the woman menstruatiug easily whilst the genital canal was healthy, menstruating with increasing difficulty and pain as the

closure of the vagina advanced, then suffering all the ills of retention when the closure was complete, and lastly being cured of her dysmenorrhœa when the vagina was restored, afforded a series of proofs to which the best designed series of experiments that could be devised could add little, that dysmenorrhœa was due to incomplete retention. Dr. Snow Beck's anxiety lest the adoption of this theory of retention should lead to mischievous treatment might be allayed by the reflection that if no cause of retention were discovered there would be no operation necessary to remove it. One rule indeed flowed from the clinical observations, namely, that in cases of dysmenorrhœa persisting and injuring the patient's health, examination of the condition of the organs whose functions were impaired should be made.—*Obstetrical Transactions, vol.* xiv. *p.* 108.

80.—THE ORIFICES OF THE UNIMPREGNATED UTERUS, AND THEIR SURGICAL TREATMENT.

By Dr. J. Matthews Duncan, Physician to the Edinburgh Infirmary, and Lecturer on Clinical Surgery.

[A great number of papers have appeared upon this subject in the pages of the British Medical Journal. It was originally introduced by Dr. Matthews Duncan, who published an article, more scientific than practical, upon the comparative dilatory power exercised by the metallic bougie, and the sea-tangle and sponge tents. Dr. Henry Bennet, as will be seen by two of his papers published in this volume (see Art. 81), is at direct issue with Dr. Matthews Duncan on a point of fact. The former says that the os internum is naturally closed in the healthy uterus except at the menstrual period: the latter that it is not closed but open, or at least so open that very gentle pressure only is required to pass a sound. This is a matter of experience. Our own agrees with that of Dr. Bennet.]

The remarks of Dr. Henry Bennet are, with few but important scientific exceptions, so just, and do so appropriately condemn much of the prevalent gynæcological practice of the day, that I am glad to have an opportunity of expressing my approval of them; and also to explain, however imperfectly, my own views as a practitioner in diseases in which the size of the canal of the cervix uteri is directly or indirectly implicated. This paper is not, like my former one, scientific—it is more of a practical character; and much of what I have to say conveys not facts, but views or impressions, which I meantime firmly believe. A daily and generally a laboriously gained experience in gynæcology of above a quarter of a century finds me very

doubtful of the true character of many of my own and others' supposed facts; and I can, in most practical matters, be sure only of honest zeal in the pursuit of truth.

The State of the Orifices of the Uterus.—The orifices of the uterus I have never found closed, except in an occasional rare case of complete atresia of the internal os of the cervix. Using the word stricture in the ordinary surgical sense, I can say that I have never seen or heard of an acquired stricture of the orifices of the uterus or of the canal of the cervix. I have often heard of stricture of the womb; but the term has then been applied in a loose and improper way to instruct or to amuse patients.

Some cases of congenital stricture or partial closure of the external os uteri have occurred to me; but such cases are very rare. This condition and other contractions of the cervical canal do not deserve the name of stricture, because they do not obstruct the passage of uterine mucus or of healthy menstrual discharge (see the Journal of Anatomy and Physiology, November 1870. p. 150). Plugs of congulated blood or of dense mucus may more or less firmly close the orifices of the uterus. The external os uteri may be, in a certain sense, closed by being adpressed by the neighbouring vaginal wall. The canal of the cervix and its internal os may be, in a certain sense, closed by swelling of the walls, or by an acute flexion, or by a growth, whether sessile or polypus-like. The external os uteri is larger and more easily dilatable than the internal os uteri. Both are, when in a state of health, at all times easily permeated by an ordinary uterine sound. Except in very rare cases of congenital or acquired contraction or stricture, both ora uteri are, in a state of disease, easily permeated by an ordinary uterine sound. The difficulties, very rarely insuperable, of passing a sound arise from missing the way, not from any obstruction. Both ora uteri may, when in a state of health, be easily and rapidly dilated to a considerable extent. By the use of bougies they may, in a few minutes and without any acute pain being excited, be dilated so as to allow a No. 9 or a No. 13, or even a higher number of the ordinary male urethral series, to pass; or, in other words, to allow a bougie a quarter of an inch in diameter to pass.

In cases of spasmodic dysmenorrhœa, the passage of a bougie, however small, through the internal os uteri causes great pain, identical with that of the spasmodic dysmenorrhœa; and not, in my opinon, identical with the tenderness elicited by the same kind of touching when the mucous membrane is inflamed, as in inflammatory or in membranous dysmenorrhœa. In such cases, the dilatation of the internal os by bougies causes great pain, like that of spasmodic dysmenorrhœa. Further, in such cases the internal os is occasionally small, sometimes transmitting an

ordinary uterine probe with a little difficulty; and the dilatation of it must be by very slow degrees, if it is to be done by a gentle or slight force, without causing any split or laceration. The internal os uteri does not recontract to its pristine condition after dilatation, but remains large for a long time (years), if not permanently; at least in many cases.

The Nature of Spasmodic Dysmenorrhœa.—Dysmenorrhœal pains, resembling those of the characteristic spasmodic disease, may be produced by uterine contractions overcoming or attempting to overcome an obstruction. Examples of this are seen in the expulsion of clots, or of dysmenorrhœal membrane, sometimes also, but rarely, in cases of acute flexion of the uterus; but the pains are, in all these cases, generally of comparatively short duration, and not so severe as those of an ordinary bad spasmodic dysmenorrhœa.

I have elsewhere given abundant reason for regarding obstruction or mechanical hindrance of discharge as having nothing to do with the great mass of cases of spasmodic dysmenorrhœa; yet it is well known that the attractive simplicity of mechanical obstruction has given it at present the chief place as a cause in the minds of gynæcologists generally, who accordingly term the disease mechanical dysmenorrhœa.

The pain is spasmodic; it may occur before, during, or after the monthly flow. There is extreme sensitiveness of the internal os uteri and of the mucous membrane of the body of the uterus. It is quite possible that a condition of inflammation of the mucous membrane may exist, but it has not been demonstrated. Many attempts have been made to establish the diagnosis and treatment of chronic inflammation of the mucous membrane of the body of the uterus, but they are in the highest degree unsatisfactory and inconclusive. Although this be true of the present condition of these ingenious attempts, and although they do not throw any clear light on the theory or treatment of this kind of dysmenorrhœa, yet very much may be expected from investigations pushed in this direction.

The process of healthy menstruation has, as has been pointed out, a great resemblance to an acute catarrh—softening and thickening of mucous membrane, intense congestion, secretion of mucus, shedding of epithelial cells, and escape of blood. When conditions similar, but morbid, occur in the bladder, we often have strangury; when in the rectum, we often have tenesmus; when in the bowels, we often have tormina; when in the bronchi, we often have asthma. So it is possible that, whether passing the bounds of health or not, the same conditions in the womb may induce spasms or spasmodic dysmenorrhœa. This is the nearest approach I can make to a theory of spasmodic or so-called mechanical dysmenorrhœa.

To this theory there is the objection, that it does not include and account for the sensitiveness of the mucous membrane of the body of the uterus, and the relief the disease got by dilatation of the internal os of the cervix: at the same time, it is to be observed that these two circumstances are not hostile to the theory, and may be quite reconcileable with it.

The Treatment of Spasmodic Dysmenorrhœa.—This may be divided into two parts; the general treatment, similar to that of all painful spasmodic diseases, and the special treatment of the uterus.

Of the former I need say nothing in this place, as it is well-known, extremely unsatisfactory, and has little connexion with the subject which is under discussion. Many cases of dysmenorrhœa recover under this kind of treatment; but it is difficult to apportion the due share of credit to the medicines and to time or the natural progress of the case.

A severe chronic case of dysmenorrhœa tests the powers of medical treatment; and the attainment of good results from it is at least not to be relied on. Yet there can be no doubt that diaphoretics, laxatives, narcotics, warm bathing, and hygienic treatment have a considerable range of utility.

The special treatment of the uterus by mechanical appliances is the only treatment which yields striking good results, and this so frequently in inveterate cases as to leave no doubt as to the direct connexion between the mechanical treatment and the improvement of the case.

Were catarrh of the cervix uteri a cause of spasmodic dysmenorrhœa, then, perhaps, good might arise from dilating by incision or otherwise the external os; just as good is said to arise in cases of irritable bladder from dilatation of a urethral stricture, and this even when the stricture is easily permeated by the urine. But I am of opinion that no distinct benefit arises from any kind of dilatation of the external os uteri; for this part has no relations with the disease of which I am aware. Yet it is well-known that authors of eminence, as Mackintosh, Simpson, and Sims, recommend this treatment.

Catarrh-like conditions of the mucous membrane of the body of the uterus are present in spasmodic dysmenorrhœa; this mucous membrane is preternaturally sensitive at all times in a woman suffering from chronic spasmodic dysmenorrhœa; the internal os of the cervix, the channel of exit from this cavity of the body of the uterus, is especially supersensitive; this internal os is also frequently diminished in size; it is with difficulty dilatable when compared with the same part in a healthy uterus; sometimes it is extremely difficult of dilatation. These circumstances, and the analogy of urethral stricture above-mentioned, prepare us for believing that some action on the

internal os uteri might ameliorate or cure a spasmodic dysmenorrhœa. The action resorted to is dilatation. This is the mechanical treatment which yields striking good results frequently in inveterate cases,—in the worst cases.

In further giving my views on this mechanical treatment, I wish to be understood as expressing only my present opinions and with great reserve. Were it not for the misunderstanding of my views which I have found to exist by reading recent criticisms on my paper on Mechanical Dilatation of the Cervix Uteri, I would not have been induced to express again so early my opinions on this important practical matter.

The means generally resorted to for dilatation of the cervix are short metallic bougies allowed to remain, tangle-tents, and cutting instruments of which Simpson's and Greenhalgh's are well-known examples. All of these means I have used, and I have had very extensive and long-continued opportunities of becoming acquainted with some of the results of their use in the practice of others. It is these means which have afforded the striking good results of which I have just spoken. But the striking good results, so far as the dysmenorrhœa was concerned, was equalled, if not surpassed, by other striking bad results, hemorrhage, metritis, ovaritis, perimetritis, parametritis, with all their numerous attendant evils and dangers. This kind of dilatation is frequently resorted to by some to remove sterility; and so frequent have these bad results been, so far as I can judge, that, whatever may have been the results as to sterility in some individual cases, I am satisfied that, on the whole, they have caused more sterility than thay have cured. The result of all this has been that many practitioners, including myself, have been gradually giving up the use of the remedy by dilatation. The evils and dangers of it, as hitherto practised, are too great, and fully counterbalance the good.

It was under these circumstances that I proceeded to investigate the subject farther, and among other things, resolved to try for the internal os uteri the treatment used for dilating the male urethra—the daily passing of ordinary male urethral bougies slightly modified, which are not allowed to remain, and whose size is day by day increased. This treatment I described in the Edinburgh Medical Journal for May, 1872 (see *Retrospect*, vol. lxvi., p. 344). I have found that the striking good results already mentioned are, at least often, attained; and this, without the occurrence of the striking bad results. I am aware of only one case in which any evil result followed this method of gradual dilatation. In it there was a slight temporary attack of adhesive perimetritis; and I believe that this was the result, not of the treatment as I would now conduct it, but of the use of more forcible dilatation than was necessary.

Future investigations may enable us to discover some class of cases in which the older modes of dilatation are to be preferred. They may also change our views as to the utility of both older and newer.

I resort to dilatation in a virgin rarely, and with extreme reluctance, and only in very severe cases.—*British Medical Journal, March* 8, 1873, *p.* 251.

81.—ON MECHANICAL AND FORCIBLE DILATATION OF THE CERVIX UTERI.

By Dr. Henry Bennet, late Obstetric Physician to the Royal Free Hospital.

I have read with interest the articles of Dr. Matthews Duncan on the mechanical dilatation of the cervix uteri, as also the subsequent remarks of Dr. Atthill and of Dr. Aveling. I quite agree with the latter writers, that Dr. Matthews Duncan has made a valuable contribution to the mechanics of the subject, and has added to our knowledge of what is actually done when *force* is used to introduce a sound or bougie into the cavity of the uterus, either for mere uterine examination or for dilitation of the os internum. I am surprised, however, that none of these gynæcologists have noticed or discussed the doctrinal points which I brought before the British Medical Association in a paper read at Birmingham last August, which was published in this Journal in October; yet these doctrinal points are at the base of the entire question of cervical dilatation. In this paper I merely reproduced the views brought before the profession in 1848, in the second edition of my work on uterine inflammation, and which I have repeated, with the authority of increasing experience, in each subsequent edition. I maintain, founding myself on anatomy and physiology, that the os uteri internum is normally closed during life, by a vital contraction of the circular fibres, which prevents, in healthy women, the easy entrance of the uterine sound *at all*, except in some women, not in all, a day or two before, during, and a day or two after, menstruation. In these healthy women force has to be used to pass it; and this force, Dr. Matthews Duncan tells us, is, in his experienced hands, equivalent to four pounds, an amount of force that would bend a metal sound if exercised at the handle.

Dr. Duncan does not speak of healthy sound women; but I believe his remark applies to them, as he appears entirely to ignore the fact that in healthy women the os is vitally closed physiologically, and evidently considers this healthy vital

closure a morbid state, as did Sir James Simpson, from which he has evidently taken this view.

The os uteri internum is actually open so as to admit the uterine sound or an equally large bougie, only, as a rule (to which, however, there may be exceptions), in morbid uterine conditions. It may be thus open in chronic imflammatory disease of the mucous membrane lining the cervical canal or cavity of the uterus, in enlargement of the body of the uterus from whatever cause, from fibroid tumours, from chronic inflammation, or from non-involution after pregnancy. In any of these states the circular fibres at the os internum *may* relax (they do not always do so), and may allow a free passage to the sound or bougie. To these states I would add that of some women of very lax fibre, with relaxed vulva, vagina, and abdomen, and with general flabbiness of tissue.

In healthy women, I repeat, as a rule, the os internum during life is closed vitally by contraction of the circular fibre. To consider this condition a morbid one is an error—anatomical, physiological, pathological. Practically, it is a most pernicious error, for it renders nearly every healthy woman who is examined liable to be considered as suffering under morbid closure. Such an erroneous idea leads to unnecessary, unjustifiable surgical interference, to cutting, to forcible dilatation with four pounds' pressure, to dilatation of all sorts and kinds, and that without real necessity.

[In another paper Dr. Bennet says :]

What is meant by all this surgical cutting and dilatation? What is the pathological condition which the dilatation or force is meant to overcome? What is the pathological condition that resists so as to bend a strong silver sound, or which can only be overcome by a pressure of four pounds? We know what a stricture is in the male urethra, the fibrous gristly nature of the contraction, and the antecedent pathological conditions; we know that, if we resort to forcible sounding or catheterism, we break through these fibrous gristly structures, and that without probably using a pressure of four pounds. What I wish to know is, what is the actual pathological condition of the cervical canal or of its orifices, external or internal, which leads one physician of eminence in London to divide the os internum with a double metrotome three hundred times in two years in his consulting room, and another in New York to divide the os externum and entire cervix down to its vaginal attachment in five hundred cases in the same period of time? Indeed, I come upon traces of these operations constantly in my practice in all kinds of cases, without finding a clue to the motive that dictated them. These serious operations, not to speak of forcible dilatation of all kinds, appear to me, judging from

what I see and hear, to be rashly, blindly carried out, as a kind of surgical panacea for anything and everything—sterility, dysmenorrhœa, displacements, &c.

This wild confusion in practice—this constant recourse to severe surgical treatment and operations in women—originates, in my opinion, in the failure to recognise the facts which I laid down in the second edition of my work on Uterine Inflammation in 1848, twenty-five years ago. I therein say and now repeat: 1. That, if the os externum will admit a good sized sound, say, No. 6 or 8, it is an absurdity to divide it on any grounds; 2. That the cervical canal between the os externum and the os internum is an infundibuliform cavity, and seldom or never is contracted or requires dilatation, except in congenital cases, or in cases where there are adhesions from the action of caustics or of labour; 3. That the os internum, so far from being open, as described in anatomical works, is closed by a vital contraction of the circular fibres, like the anus, and so closed that, except in morbid conditions, force has to be used with the sound in perfectly healthy women; the exception being certain morbid conditions, and in some physiological ones, specified in my paper read at the British Medical Association.

I think the non-recognition of this anatomical and physiological fact is at the bottom of all the rash and useless surgery which I deprecate, and that I am only doing my duty in bringing the subject before the profession from my semi-retirement on the shores of the Mediterranean. Surely, as one of the Nestors, I may say, of modern gynæcology, as one who long fought the battle of uterine progress single handed, I have a right to be heard on the subject. Nor do I think that my junior friends in the gynæcological field should feel hurt if in doing so I go counter to their views and opinions. The world of science is open to all. I have fought many a hard battle with a smiling face and a hand held out to my antagonists. Moreover, we are all responsible for our opinions uttered publicly in societies, or published in the medical journals, and must stand or fall by them.

I do not enter into any further details on this important subject, for my paper is there—in the number of this Journal for September 21—to be referred to. I would only ask every gynæcologist who reads this statement to examine carefully with the sound every case of uterine or vaginal disease, slight or severe, that he sees; and, with the exceptions named in my memoir, he will surely find that the sound stops at one inch and a half from the external os, the entire depth of the uterine cavities being two inches and a half. This is the depth at which the sound should pass—two and a half inches—if it enter the uterine cavity, passing the os internum.

When we consider that every healthy woman examined with the sound—if I am right, and if it stop physiologically at the os internum—must be considered to suffer from a morbid contraction by those who are unacquainted with the fact, it becomes evident at once to what a frightful excuse for useless surgery such ignorance leads. Every healthy woman in the kingdom examined under this impression may be pronounced to have contraction, and be dilated or incised, according to the mode of practice adopted.

When we consider, too, that, according to the census, half a million of married women are sterile (one in six), we see to what such ignorance must lead. The existence of the natural sphincter in this half million of women justifies, in those who ignore it, any wild fancy, any amount of dilatation or of division. —*Brit. Med. Jour. Dec.* 21, 1872, *and Feb.* 22, 1873, *pp.* 681, 196.

82.—ON THE TREATMENT OF PROLAPSUS UTERI.

By Dr. Charles R. Drysdale, Physician to the Metropolitan Free Hospital, London, and to the North London Hospital for Consumption and Diseases of the Chest.

As to the treatment of prolapse, or procidentia of the womb, some practitioners are much in favour of operations and of instrumental interference, whilst others are of an opposite opinion and dislike any active interference. In cases where there is subinvolution of the uterus after confinement, it is the best treatment to confine the patient to her couch for a time, and then try to lessen the weight of the uterus; whilst in cases where there is rupture of the perineum, the uterus being of normal bulk, supports are clearly indicated. In all cases of inflammation and enlargement of the organs again we must endeavour to treat the disease before having recourse to any other surgical procedure. Leeches to the uterus or other means advised for the treatment of uterine catarrh should be had recourse to, and all pessaries should be avoided, for a time at least. In all cases of procidentia, however, or in old cases of prolapse, when the uterus is healthy, or in ruptured perineum, or when great suffering results from prolapse we must try the effect of supports; again, when the bladder or rectum are much prolapsed. Nothing is of more importance than the choice of a pessary or internal support in the treatment of any form of prolapse of the uterus. The air-ball pessary of Gaziel, or the air-ring are often useful. Zwanke's pessary has been much praised; but the author confesses to disliking it for many reasons. Hodge's horse-shoe pessary is useful, but in the author's opinion, the simple ring pessaries introduced by Dr. Graily Hewitt are by far the best ever brought into practice.

Hewitt's ring-pessary is merely a copper wire ring coated externally with gutta-percha, and of various diameters, which can be moulded into any shape the practitioner pleases, thus being suitable for all cases of anteversion, retroversion, and prolapse. Sponge pessaries should never be used. They become rapidly most horribly fœtid. As to stem-pessaries they are all difficult to manage, and expensive, and the author cannot recommend any of them. Ashburner's pad is an admirable support in cases of rupture of the perineum and procidentia. The most important purpose served by all pessaries, which prove of any service, is to keep the uterus motionless. Pessaries, if worn at all, should not remain more than a week at a time in the vagina, since ulceration of the vagina may occasionally be the result of the long stay of any instrument; and, another point is, that the very smallest size of pessary that will keep the uterus up should alone be used. In procidentia the parts should, as soon as possible, be returned into the pelvic cavity, and retained there by an Ashburner's pad, if the procidentia is of recent date, whilst the patient is kept in bed for some weeks if possible. A few leeches may be useful to relieve the congested state of the organ prolapsed for some time. By attention to such wholesome rules, we may often succeed in causing the prolapse to cease, although the result is uncertain, especially when the prolapse has existed for a long time.

Several operations have been proposed for the radical cure of uterine prolapse. Fricke, of Hamburgh, about the year 1833, proposed to narrow the entrance to the vagina by partially obliterating the vulva, although the operation for ruptured perineum had been performed long before that time. The restoration of the perineum to its natural dimensions constitutes a most valuable operation when it succeeds. Unfortunately, it is by no means easy to ensure success, and in many of the cases which the author has had experience of, a complete failure has resulted, the patient being left in a worse state than she was previously. Fricke excised a portion of the lips of the vulva of about two fingers in breadth. The incisions commenced about an inch below the superior commissary and were united an inch behind the fourchette. When the bleeding ceased the borders of the incised vulva were united by sutures, ten or twelve of which were required. This operation sometimes succeeds well in elderly women, but it too frequently fails completely in its object. Mr. B. Brown, of London, in his operation, leaves the skin intact; merely removing the mucous membrane from the internal aspect of the labia from the urethra as far as the fourchette, and then unites the parts by sutures. This operation, like Fricke's, in rare cases is successful, but

generally fails; so that repose in bed, together with well contrived supports, in fact, usually does more for the patient than either of these operations. Mr. Marion Sims, and other surgeons advise the narrowing of the vagina by removing bands of the mucous membrane by the knife, or by cautery, which leaves broad contractile scars. The author has certainly seen several very favourable results from the first of these operative procedures. Even here, however, the rule is, that failure results, the exception that the operation succeeds. The permanent cure then of uterine prolapse is very rarely obtained. Dr. West is much in favour of Zwanke's pessary; but the author cannot say that his experience corroborates that of that most eminent obstetric physician. In these heroic days of surgery, Huguièr's proposals to cure uterine prolapse by means of ablation of the vaginal portion of the cervix have met with some favour. The author regards such operations as almost, if not quite unjustifiable, as the operation is a very dangerous one, and far too grave to be made use of for a disease which may be treated with so much success by palliative and innocent means.—*Medical Press and Circular, Oct.* 23, 1872, *p.* 346.

83.—THE TREATMENT OF PROLAPSUS UTERI WITHOUT MECHANICAL MEANS.

Nicolai Andreef, of Kasan, states that he remarked that in some cases of disease of the uterus the application of tincture of iodine restored the relaxed and weakened ligaments to a nearly normal state. In consequence of this observation he determined to try its action in cases of complete descent and prolapse of the uterus. The first trials gave such favourable results that he was led to investigate its action systematically, and his results have proved so satisfactory that he now publishes them in the hope of inducing others to give the results of their experience with it. The following is one of his cases:—In August 1871, a patient who had suffered for four years from complete prolapsus uteri came under his care. She had tried numerous mechanical means for obtaining relief, without advantage. He prevailed upon her to submit herself to his treatment, and in four weeks he dismissed her cured. She was twenty-two years of age, emaciated, and of weak constitution. The prolapse had followed the birth of a child four years previously. The descent of the uterus was so easy that when replaced a strong cough brought it down to nearly its whole extent. The treatment pursued consisted in replacing the uterus whilst the woman was in a recumbent position. Then, with the aid of the speculum, the fold of the vagina, that is to say, the part surrounding the os, was painted with half a

drachm of a tincture composed of one part of tincture of iodine and one part of alcohol. He diluted the officinal tincture of iodine because the undiluted tincture sometimes sets up acute catarrh of the vagina and even of the uterus; as he had had an opportunity of observing previously. After the application of the tincture the patient remained for three days in bed, and had an injection four times a day of pure spring water at a temperature of 20° R. The painting was then re-applied and the douches repeated. After a repetition of this plan of treatment four times the patient found herself well, and was dismissed. Four months subsequently she was pregnant and quite healthy; no descent of the uterus had occurred. He gives the details of other cases in which the prolapse was both complete and incomplete. His experience has taught him that the best results are obtained when the following conditions exist:—1. The uterus must be capable of being replaced in position. 2. Before the iodine plan is adopted all other diseases and lesions of the vagina or uterus, such as erosions, ulcerations, &c., must as far as possible be removed, otherwise inflammatory reaction is apt to take place. 3. It is only requisite to paint the vault of the vagina, and at the commencement of the treatment, with dilute solutions and weak doses. Subsequently, however, stronger solutions may be employed. Cold vaginal douches must always be used after the application of the iodine with a view of preventing inflammation of the uterus and vagina. 4. In the majority of instances it is not requisite for the patient to remain in bed after the first two applications. After ten days she may be allowed to return to her work if not of too severe a character. 5. It is important that the bowels should be thoroughly cleared. 6. The interval between two successive paintings should not be less than three days; also, with the object of preventing irritation of the vagina and uterus, the cold douches may be continued for some time after the last application of the iodine. When the cure is complete, the vagina does not become narrower, but it is thicker than it was before. After reposition of the uterus, some sympathetic disorders of the stomach often occur, but this is easily remedied.—*Virchow's Archiv; Practitioner, Nov.*, 1872, *p.* 305.

84.—ON REDUCTION OF THE UTERUS IN CHRONIC INVERSION.

By Dr. Robert Barnes, Obstetric Physician to St. Thomas's Hospital.

[Sarah C. was suffering from hemorrhage a month after labour, at which it was probable that a certain amount of

inversion of the uterus had occurred but had been reduced, as it turned out however only temporarily. A tumour of the size of a hen's egg was felt in the vagina, connected by a neck narrower than the body of the tumour to the os uteri. The tumour was sensitive. The tip of a sound passed into the bladder and curved backwards could be felt by the index finger of the left hand in the rectum, showing the absence of the uterus from its natural position.]

On the 14th November a caoutchouc bag was placed in the vagina and kept distended with water. This was kept up during five days. Twice I tried to reduce by taxis under chloroform. The taxis was performed by passing the left hand within the vagina, grasping the circumference of the tumour and trying to squeeze it through the ring of the os, whilst the tips of the fingers of the right hand pressed down through the abdominal wall, dipped into the funnel formed by the inverted uterus, and gave a counter-pressure and support to the hand inside.

This failing, and the patient being too much prostrated to justify further delay, I determined to make one more effort to reduce the uterus by the aid of a plan which I have advocated in my lectures for the last twenty years, and which has been also suggested by Huguier, Simpson, Sims, and others. This consists in incising the os uteri at two or three points of its circumference, so as to relax or weaken the constriction formed by the circular fibres of the cervix, before applying the taxis.

This I accordingly did on the 23rd November. I drew down the uterus outside the vulva by means of a sling of tape passed round its body. The neck being on the stretch, I made three longitudinal incisions into it, one on each side and one behind. The incisions were about a third of an inch deep and two-thirds of an inch long. I then passed the uterus back into the vagina and proceeded to re-invert. I was surprised to find how readily the uterus went through the os; but I was not a little uneasy at feeling that uterine tissue gave way, as if the incisions were extended by laceration. No bad symptoms however followed; and there was little hemorrhage. Eighteen days after the operation she had rigor and tenderness in the abdomen; but she recovered completely. On the 23rd December I made the first examination. The uterus was *in situ;* the os has a transverse fissure; all seemed to be in healthy condition. Some days later I introduced the sound. By this it was ascertained that the cavity of the uterus was somewhat shorter than normal. This I had observed by the finger at the time of reducing. It seemed as if the fundus uteri squatted down a little.

I have since heard from Mr. Bell of Rochester that the sub-

ject of this operation became pregnant some months afterwards, and had a successful labour without tendency to recurrence of the inversion.

In the second case I carried out the modifications which reflection upon my first case had suggested. Failing with simple pressure, I made a shallow incision on either side of the os uteri, omitting the third incision behind; then, instead of resorting immediately to taxis, I reapplied the elastic pressure, and tried taxis gently at intervals. The gradual gentle action is safer from the risk of laceration. I also swabbed the interior of the uterus after restoration with a solution of perchloride of iron. This is a security against hemorrhage, and by promoting contraction or corrugation of the tissues is a security against the re-occurrence of the inversion.

These two cases seem to me to be valuable in extending the power of sustained elastic pressure in reducing chronic inversion of the uterus. One drawback experienced during the application of sustained pressure is the time during which it is commonly necessary to keep it up, during which the patient must endure pain and run the risk of irritation and inflammation. It becomes a matter of great moment to shorten this period, the more so because when treatment is necessary the subject will often be so reduced by hemorrhage that she might sink before the reduction is accomplished. The plan I have practised effects what is wanted.

The repeated success which has attended it justifies me in affirming with even more confidence what I said in the memoir referred to—namely, that ablation of the uterus is not justified until after reduction by elastic pressure has been steadily tried; and that when elastic pressure has failed, there is still another resource that stands before amputation, that is, the incision of the cervix uteri.

Firmly convinced of this, I do not think it necessary to describe or to discuss at length the various methods of amputating the uterus, or effecting forcible reduction, as by Professor White's method, or by making an abdominal section through which to introduce a dilating instrument directly into the funnel of the inverted uterus from above, as devised and practised by Professor Thomas.

The forcible reduction has been attended, as might be expected, by disastrous results, the uterus having been torn from the vagina; and a method of dilatation which requires gastrotomy to carry it out must inevitably be attended with serious danger.

The case appears to be eminently one in which the moral of one of La Fontaine's fables applies:—"Plus fait douceur que violence." The sustained gentle pressure of the elastic pessary,

aided if necessary by slight incisions, will not only overcome the resistance more surely, but also with greater safety.

In trying elastic pressure I found some inconvenience in the adaptation of elastic bags. These, when distended, stretch the whole vagina excessively, and require a firm point d'appui in the perineum, which cannot always be had. They may also fail to exert pressure upon the fundus where it merges into the inverted cervix uteri so directly as might be desired. I therefore in the second case had a special instrument constructed on the model of the stem-pessary. The stem, suitably curved, is surmounted by a hollowed cap of caoutchouc, upon which the inverted fundus of the uterus rests. To the lower end of the stem are attached strong elastic tubular bands, two of which are brought up in front and two behind, to be made fast to a belt round the abdomen. By bracing up the posterior bands, a forward direction is given to the elastic cap, so that the uterus is pressed up steadily upon the fundus of the vagina, constantly tending to distend this particular part, and thus to pull open the cervix uteri. I found the instrument to answer so well that I describe it here. It is more convenient than bags, because by loosening the anterior straps ease can be given to empty the bladder, without removing the instrument; and the straps permit of ready and accurate graduation and direction of pressure, due elasticity being preserved.

The preceding histories show how nearly I fell into the error of amputating the uterus, mistaking it for a polypus. The annals of medicine record several instances where amputation has thus been carried out. Dubois relates several. Yet the means of distinguishing the two affections are entirely satisfactory. Nothing in diagnosis is capable of more precise demonstration. But inversion is so rare, and polypus comparatively so common, that the mind, preoccupied with the more common event, easily loses sight of that one which is rare. It will not therefore be superfluous if I take the opportunity of indicating the means of avoiding the error of treating an inverted uterus as if it were a polypus. I will only mention three rules.

1. Many observers bear testimony to the fact that the sensitiveness of the inverted uterus is not to be trusted to as a diagnostic sign. In many cases no pain is complained of when the body of the uterus is handled. But the case is very different when compression is applied to the neck of the tumour. The round ligaments and the Fallopian tubes are compressed, and agony, inducing prostration, is the immediate result. This is truly diagnostic, and it may be turned to account without the dangerous test of the ligature by squeezing the neck between the finger and thumb.

2. Before noosing a presumed polypus, if the sound cannot be passed two inches or more beyond the os uteri, where it embraces the neck of the tumour, the sound should be passed into the bladder, and its point felt for by the finger in the rectum above the tumour.

3. Never induce anæsthesia for the removal of a polypus. If the ligature be tightened round a polypus it gives no pain; but if it be tightened round the uterus, the pain produced gives warning and the opportunity of retrieving error at the last moment.—*Obstetrical Journal, April* 1873, *p.* 1.

85.—TWO CASES OF LARGE FIBROID TUMOUR OF THE UTERUS SUCCESSFULLY TREATED BY ENUCLEATION.

By Wm. Ross Jordan, Esq., Surgeon to the Birmingham and Midland Hospital for Women.

The cases which follow are two of the most interesting cases of fibroid tumour of the uterus that I have treated in the Hospital for Women, both the tumours being in the wall of the uterus, and having no tendency to point into the cavity. The treatment was similar in some respects to that recently recommended by Dr. Meadows, but seems to have been much more expeditious in its results; whilst another case, still under treatment, is progressing very slowly.

Case 1.—Mary Jane B., aged twenty-four, single, small and sickly-looking—in fact, presenting a striking picture of exsanguine emaciation, not being able to walk into the room without help. She came to the Hospital for Women on the 12th of September as an out-patient, complaining of very frequent and profuse hemorrhage. On examination, she was found to have a large fibroid tumour in the anterior wall of the uterus, which could be easily felt through the wasted walls of the abdomen. The uterine cavity measured four inches. The general condition of the patient demanded immediate attention, and I proposed to take her into the hospital; however, she preferred to take physic for a time, and try its effect. The following week she was much the same, and elected to come in; but, as we had then no room, she was not admitted until the 24th. She was allowed a few days' rest in bed previous to the commencement of active treatment.

On Sept. 28th an ordinary-sized tangle tent was introduced into the cervix, which unfortunately was not retained, and was followed by considerable hemorrhage. A few days' further rest was given to allow any irritation from the first tent to subside; and on the 3rd of October another tent was introduced, which remained in position, and caused very little loss

of blood. Next day the tangle tent was removed, and followed by a large sponge tent. On thr 5th the cervix and cavity were sufficiently dilated to admit of a free investigation. The result was that the first diagnosis was confirmed, a large tumour being found in the anterior wall of the uterus, and not presenting any marked projection into the cavity.

Oct. 5th. An incision was made into the lowest and most prominent part of the tumour with a guarded bistoury, about half an inch deep. The cervix in a line with the incision was divided with a pair of strong scissors. For a few days she went on very comfortably, without hemorrhage, and with very little pain, the tumour showing no disposition to extrude.

9th. Going on well; feeling better; an offensive watery discharge has come on.

About this time I went from home for a fortnight. The notes of the case on the hospital paper (made by Dr. Louisa Atkins, resident medical officer, who also had charge of the patient, and to whose care and attention in this and other cases much of my success has been due,) show that a very offensive discharge was present, and considerable pain, at times very severe, and that she suffered from symptoms of pyæmia, the temperature being on one day as high as 39·8°C, and for a week or ten days varying between 37·5° and 38·5°. I returned home on the 24th, and found the note of the morning state, "hemorrhage, not profuse; pain; offensive discharge continues." Before the next note was made I saw the patient, who said that the pain had become worse than usual about four in the morning, and that it had increased in severity till eleven, when, with very violent pain, something came into the passage. Judging from her description of the pain, it was very like the pain of labour. A superficial examination showed a large, rounded mass, filling the cavity of the vagina. As she complained of great tenderness on examination, and was full of fear, chloroform was administered, and a large fibroid, about six inches long by three, was found perfectly free in the vagina, and removed without difficulty.

25th. Going on well; appetite good. Has slept well. Temperature in the morning normal; in the evening one-fifth higher. The temperature had been nearly normal in the morning for the last three days, but in the evening had gone up to 38°.

31st. Doing well; discharge nearly gone. The uterus has resumed its natural size and mobility.

A month later the patient came as an out-patient. She was scarcely recognised, so much improvement having taken place in her general appearance. She is stout, and has a good colour.

Case 2.—Mrs. S., aged forty-six, married, has had five chil-

dren, the last twelve years since. Has been under treatment for some time for a hard swelling in the abdomen; suffers from great and frequent hemorrhage, and is in a state of great exhaustion. Examination of the abdomen showed a hard, irregularly rounded tumour, reaching from the pelvis to the umbilicus, four or five inches from side to side. Vaginal examination showed the os and cervix large, the latter swelling out after the manner of a pregnant uterus, movable; sound, six inches and a half by a circuitous route, and in front of a solid mass, could be easily felt below and to the right of umbilicus—in fact, so easily as at first to cause some doubt as to whether it were still in the uterus.

The same plan of treatment was adopted as in the last case—viz., two large and long tangle tents were introduced. On the next day it was found that one of them had slipped into the cervix, so that the os was only dilated by one, whilst the cavity was expanded to the size of both. They were removed, and a large sponge-tent put in their place. On the following day the sponge was removed, the smell being very disagreeable. There was now sufficient room to introduce two fingers into the cervix and to find a large tumour in the posterior and left wall of the uterus.

Feb. 8th. An incision was made about two inches long on the lowest and most prominent part of the posterior wall, the cervix being divided in the same line by scissors. On passing the finger into the wound and separating the tissues between the mucous wall and the tumour about an inch each way, a soft roundish mass distended the wound. There was little hemorrhage. On the next day (the 9th) the mass had filled the opening of the wound, but did not project; on the second day (10th) the tumour projected into the vagina about the size of an egg; the third day (11th), at eleven a.m., the tumour was as large as a small fist, and nearly filled the vagina. Finding that it was still firmly fixed above, and that it was so soft that the vulsellum forceps tore their way out of it if much traction were made, ergot was given every three or four hours, and at seven p.m. the tumour was attacked with the intention of removing all if possible, if not, part, as it was getting offensive. After half an hour's tugging and coaxing, a tumour weighing twenty-seven ounces was removed; the uterus was injected with a solution of Condy, and on examination an irregular but flat mass was still felt in the cavity. This not being large, and probably being the irregularly-contracted mucous wall which had covered the anterior aspect of the tumour, was allowed to remain to contract and subside into its natural place, if part of the uterus, or to be expelled if part of the tumour; but as the upper portion of the tumour, or that part which was last de-

livered, was most entire and perfect, it was left, with a strong notion that it would stay.

Ergot was given for several days to aid contraction and prevent hemorrhage. Patient went on favourably and left the hospital on March 10th, comparatively well, but still weak.

These reports show that there are many cases commonly regarded as hopeless which may be cured, and in which no great harm can be done. The treatment is simple, and although some surgeons may consider it too heroic, very little harm can follow if care be taken to keep the incision over the bulk of the tumour, and if the fingers are not too vigorously employed to separate the capsule. Should this treatment not finally expel the tumour, it will probably relieve the hemorrhage for a considerable time.—*Lancet, March* 29, 1873, *p.* 442.

86.—ON THE CAUSATION OF ACQUIRED FLEXIONS OF THE UTERUS AND THEIR PATHOLOGY.

By Dr. Squarey.

The author's object in this paper (read before the Obstetrical Society of London) was to explain why, in two cases, the same causes and conditions apparently existing, an anteflexion is found in the one case, a retroflexion in the other. Having shortly noticed the anatomical relations of the uterus, the author called special attention to the rising and falling of the uterus in the pelvis in different positions of the body, and to the alteration in the direction of the axis as it so rose and fell, pointing out that in whatever plane of the pelvis the uterus might be situated, its axis was invariably at right angles to that plane; and he showed, referring to drawings, that the axis of the uterus varied considerably in these different positions, looking when low down almost in an opposite direction to what it did when high up; and, consequently, that the direction the fundus uteri took in a flexion depended entirely on the situation of the uterus in the pelvis at the time that the cause producing it came into action. Thus, when an anteflexion is produced, the uterus is situated high up in the pelvis, occupying its normal position, the axis being forward, so that any force striking it from above would impinge on the posterior and upper surface of the fundus, and so force it forward and produce anteflexion; that when a retroflexion is produced the uterus has from some cause sunk more or less deeply in the pelvis, and has its axis diverted more or less backward, so that any force striking it from above would impinge on the anterior and upper surface of the fundus. As a proof of the correctness of this view, reference was made to the predisposing and

exciting causes of flexion, as described by Dr. Graily Hewitt. Anteflexion is found to be much more common in young adults and in the virgin state, while retroflexion is much more common in older women and in women who have borne children. Again, when retroflexion exists in virgins there is almost invariably a history of depressed general health, and there exists relaxation of all the tissues. In speaking of the pathology of flexions, he specially referred to those cases in which a sudden strain causes a flexion. What, in such cases, keeps the uterus in its flexed position? When retroflexed, the pressure of the intestine explains it; but this does not apply to anteflexion. The author believed it to be due to loss of tone of the uterine tissue; the loss of tone being due to some bruising of the uterine fibre, with some slight effusion of blood into its tissue.—*Lancet, Dec.* 28, 1872, *p.* 916.

87.—ON FIBROID DEGENERATION OF THE UTERUS AND THE BEST WAY OF TREATING IT.

By Dr. Protheroe Smith, Physician to the London Hospital for Women.

There is, perhaps, no pathological condition which has received greater attention of late years from gynæcologists than that known as fibroid disease of the uterus. Although generally recognised as forming numerically by far the largest portion of the morbid affections of the organ, fibroids of the uterine tissue present great varieties of situation, form, and relation to adjacent organs, and consequently the attendant physical signs and symptoms are proportionately manifold. This has probably led to the contrariety of opinion and difference of treatment which obstetric physicians have advocated.

The disease is found intimately associated, and sometimes as it were intermingled, with the normal contractile tissue, which makes up the bulk of the organ in contradistinction to the soft tissue lining the uterus, and which gives rise to that vascular growth known as mucous polypus. While thus intercurrent with the contractile fibre-cells, the attendant symptoms, both local and general, may be explained by the irritation which is created, inducing a constant though generally ineffective effort on the part of the uterine contractile fibres to expel the offending matter. When such an effort is successful, the mass is either projected into the uterine cavity, covered only by the lining membrane, and becomes polypoid, when it is easily removed by ligature, *écraseur*, or scissors; or, if thrust through the contractile tissue, it is expelled outwardly, or, if formed by deposit in the cellular tissue directly beneath the peritoneum,

it becomes a subperitoneal fibroid, where it only annoys by the effect of its bulk and weight on adjacent organs, when it can only be removed, if pedunculated, by an abdominal section, or, when implicating the uterine structure, by the extirpation of the whole of the uterus and appendages—an operation unjustifiable excepting in extreme cases, fraught as it is with much peril to life. When the disease is distinct from the normal structure, but sessile in form, it may often be successfully treated by incising and dilating the cervix and enucleating the mass, by removing it piecemeal with ligature or *écraseur*, &c.—a plan of treatment which I have adopted with complete success in several cases extending over a period of seven years.

In instances in which excessive hemorrhage demanded it, and in which enucleation was impracticable, I have found incising the mass, with the uterine tissue embracing it, especially the cervical portion, productive of the happiest results. In some long standing cases, with flexion or retroversion of the fundus, continuous pressure, by means of a fixed intrauterine support, has been followed by reduction in bulk, and in some instances even by the entire disappearance of the tumour. Acting on this suggestion, and seeing that every natural cure, by polypus and exfoliation, was the result of contractile efforts, I have endeavoured, when beyond the aid of surgery, to treat these diseases by helping forward, medicinally or mechanically, the natural efforts for their cure, viz., that of compression and expulsion; the former, compression, diminishing the vascularity of the primary albuginous or sarcomatous state, and converting it into inert fibro-cartilaginous, cretaceous, or osseous matter, thus effecting that change in the disease from a soft erectile, easily congested or inflamed, and growing or active tissue, into that dense and more compact and less organised structure which is not so capable of congestion and inflammation. This condition constitutes its passive form, usually observed after the cessation of menstruation, when (following years of suffering, the consequences of uterine irritation, inducing hemorrhages and sympathetic or reflex pains and distress) a state of good health often follows, interrupted only, as far as the fibroid is concerned, when by mechanical irritation it incommodes adjacent organs. Of all the means of relieving such secondary annoyances, parietal support is the most eligible, to procure which the "pelvic band" is by far the most effective means. Medicinally, ergot of rye with borax, the application of cold externally, by compress or otherwise, and *per vaginam* by douche, with mineral acids and astringents, the recumbent posture, the pelvis being kept above the level of the heart, and a high and dry situation, will be found amongst the most effective remedies. To aid expulsion

there is nothing like ergot of rye and borax, taken in doses of from fifteen grains to thirty of the former to five of the latter. When enucleation of a large mass is attempted, the most dependent portion should be removed as soon as possible after it becomes detached from the uterine wall. This is most important, as, if it be left till the greater portion has become loosened from its attachments, there is danger of disintegration of the loosened tissue, and of consequent blood-poisoning.

To accomplish the enucleation of a large intramural fibroid, the cervix uteri, when it is required to expose the disease, should be incised laterally throughout its entire length on both sides; after which it is easily dilated by sponge-tents, and by the fingers or hand, and the swelling may then be gradually peeled off from the walls of the uterus by repeated efforts, as the patient is able to bear it—always removing, by ligature or otherwise, from time to time, such portions of the disease, as may come within reach. To do so, I prefer, as a rule, the ligature applied by Gooch's canula to the *écraseur*, because during the process of separation there is always an attempt on the part of the womb to expel the disease, and at the same time to keep dilated and open the os tincæ and cervix, thereby rendering future operations more easy than when the piece is at once cut off and the remainder retires within the embrace of the uterus. When the chief bulk of the disease has been removed, the remaining portion is usually absorbed, and the cure is completed, as shown in the case above quoted.

Passing by the consideration of recurrent and fibrocystic disease, I would call attention to fibroid degeneration of the cervical portion of the uterus. This perhaps is, if not the most frequent, a very common form of the disease—often, I believe, mistaken for *élongement*, or utero-cervical areolar hyperplasia, simple induration, and even for carcinoma. The microscope, and a more attentive investigation of the subject, will, I think, confirm the conclusions to which observations extending over a period of thirty years now enable me to make the following brief and concluding remarks.

There is scarcely any condition of the uterus which is accompanied by more distressing symptoms and disorders than that under consideration. It may be shortly described as presenting usually an increase both in bulk and length of the cervix uteri, which becomes much firmer and often nodulated, the nodules being generally more indurated than the surrounding tissue; the os is patulous, and one or both labia are everted, and the lining membrane congested, inflamed, and granular. With the speculum, the labia are in its early development seen to be injected, becoming afterwards, however, often pale and exsan-

guineous. The disease usually commences in the labial portion of the cervix, and subsequently implicates the deeper structures, extending at times throughout the whole length of the cervix, and in some instances is continuous with similar degenerations in the body and fundus; when so, there is usually considerable deformity, resulting from flexion and torsion of the organ.

The symptoms may be briefly described as rectal, vaginal, or vesical pains and irritation, bearing down, thick mucous leucorrhœa, weariness and aching in lumbar and sacral regions, and in the hips and thighs, with lameness of one leg, sympathetic pains in the dorsal region and scrobiculus cordis, nausea, and other dyspeptic derangements, with various nervous and hysterical affections. No general treatment that I am aware of gives permanent relief to this distressing malady. The entire removal, however, when practicable, of the diseased structure proves the truth of the foregoing pathological description, by the complete relief to the symptoms which usually follows the means which I here advocate for the cure of the disease.

When simply labial, it may be amputated by means of the *écraseur*, or destroyed by the actual cautery or bromine; but I prefer and always employ potassa caustica for this purpose, whether the affection be superficial or deep-seated, for the following reasons.

It may be used with perfect impunity, and it gives comparatively little pain. It may be employed with such accuracy and precision as nothing but the scalpel otherwise can afford; and, when proper caution is observed, it leaves no injurious consequences behind, as puckering and contractions of the adjacent vagina, &c.

It is impossible here to do more than very concisely to mention the *modus operandi* of this remedy and its results. By means of my expanding cylindrical speculum, the patient lying on her left side, I procure not only a more extensive view of the uterus than by other means, but the upper part only of the vagina being thereby expanded, a basin is, as it were, formed edgeways, which is filled with vinegar and water up to the exact line, as far as that on which you intend to operate, with the potassa caustica. In doing so, all risk of injury, by the melting and *débris* of the caustic, is obviated.

When the disease is of long standing and very hard, after one or two applications of the potassa caustica, its character is obvious. Contrasted with the surrounding red normal tissue, it is distinctly seen to be of a white colour (like that of white India-rubber or the fat of beef); relief from pain is often

immediately felt after separation of the first slough, and this is, I believe, owing to the removal of the tissue investing the disease, which beforehand prevented it from being expelled, by the fruitless contractions which its presence usually provokes. On the contrary, it will be seen, after each application of the potassa, that the white fibrous matter, rubbed down to a hollow by the caustic, becomes in three or four days a projection, and thus, however deeply implicating the cervix, the whole is gradually thrust forward so as to be brought under the solvent action of the potassa till the whole is enucleated. When no remaining disease can be felt, it only remains to pass a large-sized bougie daily to the extent of the wound to prevent cohesion of its sides whilst healing.

From amongst a mass of cases, I must content myself by enumerating some of the favourable results I have seen from such treatment: speedy and entire relief from pains, lameness, in a word the symptoms already mentioned as indicating the disease, followed, in several instances, by pregnancy and healthy labours. In illustration of the subject, I would conclude by quoting the following case recently treated by me in the Hospital for Women. I do so the more readily, because it was taken by Dr. Snow Beck, who had, previously to treatment, demonstrated microscopically the fibroid character of the disease, although the extreme fœtor of the discharges, and the severity of the pains, and the sallow and distressed aspect of the patient had suggested the possibility of cancer. It will be remarked that, by acting in accordance with this view of the pathology of the case, notwithstanding the difficulty and extreme caution required in using so powerful an escharotic at such a depth, a perfect cure resulted, the patient continuing entirely free from the pains, headaches, and other distresses which had made her life for so long almost insupportable.

M. H. T., aged 45, married twenty-four years, was admitted May 15th, 1872. She had had twelve children, the youngest seven years ago. She had children quickly. Nine years ago she saw me on account of leucorrhœa. She had leeches applied occasionally. On admission, the lips of the uterus were very tender on pressure, with an induration in the cervix, giving almost the feeling of carcinoma, together with an offensive discharge. Potassa caustica was applied to the lips and neck of the uterus about twice a week for about eighteen times. Ergot was administered, and as the growth was rubbed down, the uterus pushed the fibroid growth forward. The result was complete removal of all fibroid deposit with entire relief from pain, leaving a small round os uteri with normal tissue around it.—*British Medical Journal, Dec.* 28, 1872, *p.* 713.

88—ON INTRA-UTERINE MEDICATION IN THE TREATMENT OF CHRONIC UTERINE CATARRH.

By Dr. W. S. Playfair, Professor of Obstetric Medicine at King's College, and Physician to the Hospital; Examiner in Midwifery and the Diseases of Women to the Royal College of Physicians.

The superficial erosions and abrasions caused by the removal of the epithelium from the surface of that part of the womb, dignified by the high-sounding name of ulceration, were formerly so readily observed through the speculum that far too much attention came to be paid to what is, after all, a comparatively unimportant symptom; and it must be admitted that the speculum and stick of nitrate of silver came to be used or abused in a manner which is much to be deplored. Nothing in Dr. Bennet's work justified the errors into which his overzealous disciples fell, but the fact that the errors were committed is none the less certain.

Then came reaction, and we have it on the authority of one of our most eminent physicians that "ulceration of the womb, which was once so common, has now given way to displacements;" and the statement represents what I believe to be a fact, that the same exaggerated attention which was once given to mere superficial changes in the cervix is now paid to alterations in the axis of the womb, which, like them, I hold to be, in a large proportion of cases, of a merely secondary nature.

It would be impossible for me, in the short space of time I have at my disposal, to enter at any length into the pathology of the conditions which may render intra-uterine medication admissible, since I propose, in these lectures, rather to direct your attention to the methods of applying it, which are not discussed in any of our English works, and to meeting certain of the current objections which are most commonly brought forward against it. But I am anxious not to incur the imputation of advocating a routine treatment; and I must say one word as to the class of cases in which it is employed. These are of the kind which have been variously described as "chronic uterine catarrh," "endo-cervicitis," "endo-metritis," "uterine leucorrhœa." The precise nature of many of these is no doubt complex. The chief and most prominent symptom observed on examination is a profuse, glairy, tenacious discharge, like the white of an egg, pouring out from the os uteri; and accompanying this, we very generally, but not necessarily, observe a varying amount of abrasion of the cervix, depending essentially on the epithelium being stripped off the villi covering its mucous membrane, which, in old-standing cases, become markedly

granular and hypertrophied, having a florid red appearance, and bleeding on being roughly wiped. These changes upon the exterior of the cervix unquestionably depend on and are connected with a similar morbid state of the mucous membrane lining the cavity of the cervix and the body of the uterus; and it is just because the cure of these easily observed external changes is of comparatively small and merely temporary value that it is necessary to resort to intra-uterine medication. But it is very rarely that these are the only symptoms. Most frequently there is also marked change in the body of the uterus; engorgement and hypertrophy from plastic exudation into the substance of the uterine walls and neck; often enough, but by no means universally or even generally, concomitant flexions from the falling forwards or backwards of the overweighted uterus. All these morbid states are to be traced to inflammatory or congestive conditions, arising in many cases insidiously, and traceable very frequently to changes in the uterus connected with pregnancy, too often neglected in their early stages until they have thoroughly undermined the health of the patient. To direct attention solely to the profuse catarrhal discharge of the uterus, of which it is so prominent a symptom, would, therefore, be a great mistake; and in arranging a suitable treatment for cases of this kind we should be careful not to take too narrow and one-sided a view of them. But it can hardly, I think, be questioned that the mucous membrane lining the deeper-seated parts of the generative tract is in itself usually in a very morbid state whenever a large quantity of discharge is secreted from it, and that it is hopeless to expect a complete cure of the patient's sufferings unless this is modified by such topical applications as we would undoubtedly use in similar states of the mucous membrane in other parts of the body. How common it is for us to see patients who have for years been in a state of chronic invalidism; who have been from one hospital to another; who have taken pints of strengthening medicine; who have been kept for months in the recumbent posture; who have been leeched, scarified, and blistered; who have suffered from all those anomalous reflex disorders so common in old-standing uterine disease; and who may have got some temporary, but no lasting, benefit from all the treatment they have undergone.

You may consider this an exaggerated picture, and no doubt it is only applicable to the worst class of cases. That it is not, however, an untrue one of them you may believe on the testimony of so eminent an authority as Scanzoni, who says: "We may esteem ourselves fortunate if we can but moderate the hypersecretion of the mucous membrane, and moderate its consequences. As for ourselves we do not remember a single case

where we have been able to cure an abundant uterine leucorrhœa of several years' standing. Many women whom we have been called upon to treat, had to attribute to a neglect of the disease a bodily and mental debility which they would keep for the rest of their days, or hysterical attacks which deprived them of all enjoyment for life."

If you bear in mind the complex structure of the mucous membrane, you will readily understand how important it must be that it should be in a natural and healthy state. For in addition to the peculiar penniform rugæ lining the cervix, we have the villi of the uterine neck and the innumrable glandular mucous ducts which cover the entire lining membrane of the cervix and body of the uterus. The question has been hotly contested whether, in chronic leucorrhœal discharges escaping from the os, it is the lining membrane of the cervix or body of the uterus that is most at fault. Interesting as the question may be from a pathological point of view, it seems to me to be of secondary clinical importance, because in any attempt to cure the morbid state of the mucous membrane our remedies must be applied equally to the whole lining membrane of the generative tract beyond the os. It is obviously impossible to limit them to any one portion of it. One point of importance should be noticed—that in all old-standing cases of chronic uterine leucorrhœa the os uteri and canal of the cervix are in a morbidly open and patulous condition, admitting the sound or uterine probe with the greatest ease, and enabling us to move it freely about the dilated cavity of the uterus. This peculiarity has been noticed by all who have written on intra-uterine treatment, which it materially facilitates; and it is remarkable that the patency of the cervical canal diminishes *pari passu* with improvement in the case. I mention it here especially because, to my mind, it effectually disproves the theory lately advanced by my friend Dr. Graily Hewitt, in the new edition of his well-known work, that chronic uterine leucorrhœa is the result of the cooping up of uterine discharge from obstruction of the uterine canal, generally the result of flexions. He maintains that previous dilatation of the cervix has come to be an essential part of intra-uterine medication, and that the beneficial result "is sufficiently explained by the dilatation, which, by straightening the canal, renders it thoroughly patent." We shall presently see, however, that such preliminary dilatation is only necessary when intra-uterine injections are used—the worst of all forms of intra-uterine treatment, and one which, I believe, should never be employed.

Let me, before proceeding to discuss the various modes of intra-uterine medication, especially insist,—

1st. That I do not recommend intra-uterine medication in a

hap-hazard way whenever we meet with a case accompanied by profuse leucorrhœal discharge, but only when this is very abundant, and when it evidently comes from the deep-seated parts of the uterine canal beyond the os, from which it is seen issuing through the speculum; and even then only when the case has proved rebellious to other and simpler methods of treatment.

2nd. That I never adopt it unless I am satisfied that the uterus is likely to bear it with impunity, and that where there is much tenderness of the womb on being touched, even when the case is otherwise suitable, I deem it advisable first to remove the congested condition by rest, the application of one or two leeches, the introduction into the vagina at bedtime of pledgets of cotton wool thoroughly soaked in glycerine, as recommended by Marion Sims, the use of sedative pessaries, and other suitable means; and that the slightest evidence of any concomitant inflammatory mischief or irritation, recent or of old standing, in the neighbourhood of the uterus, as in tenderness or pressure in the region of the broad ligaments, or in fixity of the uterus in some part of its contour, is an absolute contra-indication. To careful attention to these precautions I probably owe the fact that, though I have been constantly adopting intra-uterine medication for the last four years, I am still able to say what I observed in a paper on the subject which I read at the British Medical Association at Leeds in 1869, that I have not yet met with a case in which anything but good followed its use. This is the more satisfactory, as I am quite willing to admit that this, like every other form of treatment involving mechanical manœuvres, whether in connexion with the uterus or any other part of the body, is capable of doing harm if rashly, injudiciously, or unskilfully used.

3d. Intra-uterine medication should not interfere with any other kind of treatment, local or constitutional, which the peculiarities of the case may require. Into the details of this it is clearly impossible for me to enter at present, but it is far from my intention to undervalue it, and, indeed, no one lays greater stress on careful attention to all the usual methods of treating such cases than I do. It is only as an accessory and additional to them that I advocate that which I am specially discussing.

[Uterine injections were used by Hippocrates. They are mentioned by Paulus Ægenitus, and are recommended by many of the older writers. There have however been so many unfortunate results from their use as to throw doubts upon their admissibility, at any rate as an ordinary mode of treatment.]

Hennig observed that sometimes blue ink, injected with only moderate force, found its way into the venous system of the uterus and broad ligaments without any apparent laceration having been produced, and this, he believes, may explain the cases of metritis and peritonitis that have followed their use. The evidence is overwhelming, however, that intra-uterine injections, however carefully practised, and however small in amount, are apt to be followed by very alarming, if not dangerous, symptoms. All who have used them much have met with cases of the kind. These seem to arise from intense uterine colics, resulting from the efforts of the uterus to expel fluid for which there was not sufficiently free exit through the os uteri, and the pain is described as very severe, and accompanied by grave constitutional symptoms. My predecessor, Dr. Priestley, has related to me a case in his own practice which forcibly illustrates the kind of evil to be apprehended. On one occasion he injected a solution of nitrate of silver into the uterus of a patient for an obstinate uterine leucorrhœa, which had resisted all other treatment. This was done in his own consulting-room, and immediately after the patient was seized with intense abdominal pains, so violent that she had to be carried to a bedroom, and it was not found possible to move her until a day and a night had elapsed. The symptoms then gradually diminished, and no further ill effects followed. Courty, who is himself an ardent advocate of intra-uterine medication, tells us: "J'ai vu naitre instantanement â la suite de ces injections des accidents si formidables, que je ne suis bien promis de n'y revenir jamis avec les liquides caustiques."

It has been said that if the cervix were first dilated with laminaria or sponge tents, or with graduated metallic bougies, these bad results need no longer be feared. I dare say this would be the case, since the balance of evidence is clearly in favour of their arising from mechanical distension of the uterus. But to treat effectually an old-standing case of uterine leucorrhœa we require to renew our applications at intervals for weeks or months. To suppose that, under any circumstances, it would be justifiable to repeat the dilatation of the cervix, say once a week, is an absurdity. My experience has taught me to look upon dilatation of the cervix as a formidable operation, apt to be followed, even when most carefully done, by serious inflammatory mischief, and only to be undertaken when absolutely unavoidable. If, then, dilatation is an essential preliminary to intra-uterine injection, as by common consent it seems to be, that method of treatment is at once put out of court in case of uterine catarrh, although it may still be admissible in other conditions, such as menorrhagia, where their frequent repetition is not necessary. This is a verdict that I the more readily

acquisce in, because the same results can be obtained by simpler and equally efficacious means.

The danger of intra-uterine injection has suggested the application of various solids to the uterine mucous membrane. Sir Jas. Simpson occasionally employed for this purpose fine intra-uterine pessaries, made of some soluble material with which nitrate of silver or sulphate of copper was mixed. Dr. Braxton Hicks also uses points made of sulphate of zinc, which are passed into the cervical canal and allowed to melt there. Of these contrivances I have no personal experience, but it seems to that it must be difficult to pass a brittle or flexible pessary of this kind into the interior of the uterus. If the pessary be sufficiently powerful in its composition to have a decided alterative effect on its mucous membrane it would seem unsafe to leave it for an indefinite time in the interior of the uterus, and if it is not sufficiently powerful it is not likely to be of much benefit.

Dr. Thomas, of New York, recommends medicated tents of sponge, of sufficient size to fit the cervix, and saturated with various alterative applications, such as nitrate of silver, tannin, or the like. He supposes that they act in two ways, partly by bringing the alterative application they are imbued with into direct contact with the mucous membrane, and partly by the pressure they impart during dilatation. The use of sponge-tents is strongly recommended by Dr. Emmett and others, as in itself of great value in certain conditions of chronic hypertrophy of the cervix, combined with a granular state of its villi. For the reasons I have already mentioned, I have always considered this expedient to be inadmissible. I believe that there are few gynæcologists who have not seen severe inflammatory attacks follow the use of sponge-tents, even when most carefully used, and I confess to never employing them without apprehension.

Various contrivances have been invented by which nitrate of silver in substance may be applied to the uterine mucous membrane, such as melting it over the extremity of a uterine sound, or passing through a stick of it a fine platinum wire, by means of which it is passed through the cervix. Another expedient of the kind is one very strongly advocated by Professor Courty of Montpellier, by which he tells us, he has never failed to cure every case of uterine catarrh, however obstinate, that he has had under treatment. It consists in passing into the cavity of the uterus a small piece of solid nitrate of silver which is allowed to remain there. The caustic gradually melts, mingles with the uterine discharge, which Courty supposes prevents any undue irritation of the parts, and gradually flows over the entire mucous membrane. Certain precautions are insisted on in using this application, principally that several days should

have elapsed since the entire cessation of the menstrual period, the absence of any flexion of the uterus which might prevent escape of the discharge saturated with the melted caustic, and the absence of any marked congestion or irritation of the uterus.

Now it must be admitted that it would be difficult to imagine anything more apparently violent in its action than this. The natural objection to it is that it is a coarse mode of treatment, and one of which we cannot control the action. In addition to this there seems to be some risk of producing induration and contraction of the cervical canal, a result which has been said to follow even the repeated use of a solution of nitrate of silver. For these reasons I have not myself practised it, but the high estimation in which it is held by so eminent a gynæcologist as Courty, and the assurance he gives us that a large number of his pupils have constantly used it with success, prove I think, that the application of the caustic itself is not followed by the serious consequences many have feared.

Mr. Clay, of Birmingham, has recently proposed to medicate the interior of the uterus by means of the insufflation of powders. He combines the remedial agent with finely powdered wood charcoal. The powder is introduced by a special instrument contrived for the purpose.

The last mode of intra-uterine medication is by using fluid applications—such as tincture of iodine, a solution of nitrate of silver, chromic acid, and the like,—which are applied to the uterine mucous membrane by some contrivance which admits of its surface being covered by the application without any amount of fluid being left in utero. This method of painting over the diseased surface is, to my mind, by far the safest and most effectual we can employ, having none of the objections which I have mentioned with regard to the others; and it is, indeed on this principle that we treat morbid conditions of the mucous membrane in other and more readily accessible parts of the body—as, for example, in the fauces and conjunctiva.

One of the earliest and strongest advocates of this method is Professor Miller, of Louisville, U.S., who claims, and apparently with justice, to be one of the earliest advocates of systematic intra-uterine treatment, inasmuch as he practised and taught it so early as 1854. His method seems to be somewhat clumsy, consisting in pushing thin strips of lint, four or five inches in length and a quarter of an inch in width, saturated in the solution employed, through the cervix and up to the fundus, either by the uterine sound or by a two-branched instrument called a fluid *porte caustique*, within which the strip of saturated lint is placed. Such a manœuvre—of which, however, I have no practical experience—would appear to require more violence than one would willingly use. But before pro-

ceeding to a description of the plan I have myself always employed, I would wish to draw attention to the experience of a physician, who has for so many years adopted the practice, with regard to its safety. "Since that date (1855)," says Dr. Miller, "I have cauterised the cavity of the uterus a great many times, not only with nitrate of silver, but also with creasote, sulphate of copper, tincture of iodine, and even with acid nitrate of mercury, without any more pain than attends cauterization of the cervix, and without any evil consequences whatever. My own multiplied clinical observations compel me to dissent from the prevalent, if not universal, opinion that the cavity of the body of the uterus is a sanctum, which is much more sensitive than the neck, and will not brook any form of therapeutic approach—an opinion with which even Dr. Bennet is strongly imbued. I say again that I have not found it so; but, on the contrary, I treat the cavity of the body as familiarly, and with as little apprehension as I do that of the neck." The above was written in 1858; and in a *brochure* published in 1871, the author tells us that a farther experience of thirteen years has only tended to confirm his former views. Surely if the practice is so hazardous and fraught with danger as we have been taught to believe, it would be impossible for anyone with so large an experience in its use not to have long ago found out its risks. My own experience most amply corroborates Dr. Miller's; and I sincerely believe that an unfounded prejudice has caused us in England to neglect a most valuable remedy.

[In the following paper Dr. Playfair describes the method of proceeding he has himself adopted in the treatment of chronic intra-uterine catarrh, and which a considerable experience has convinced him is the most efficacious, as well as the most easily applied.]

It consists in applying the remedial agents in a fluid form to the interior of the cervical and uterine cavities by means of swabs. For this purpose I have had constructed a series of uterine probes, made of a soft metallic extremity, $2\frac{1}{2}$ inches in length, corresponding to the ordinary measurements of the uterine cavity. These are made as fine as possible, and they are considerably less bulky than an ordinary uterine sound, so that when wrapped with cotton wool they are sufficiently small to pass readily through the os uteri.* They are attached to box-wood handles 9 inches in length, so that there is no difficulty in working with them through the speculum. The flexibility of the probes is of essential importance, as it enables us to bend them to the exact shape of the uterine cavity, just as we do the uterine sound; and thus intra-uterine medication can easily be used even in cases which are accom-

* Manufactured by Matthews Brothers, Portugal Street, Lincoln's-Inn-fields.

panied by the most well-marked ante or retro-flexions of the uterus, without the necessity of first replacing the flexion, as in other methods of treatment. I have, in fact, constantly treated cases of this kind without any attempt at altering the abnormal position of the uterus, and found that this has gradually disappeared as the uterus has assumed a more healthy condition; thus effectually showing that the flexion does not cause the uterine catarrh. Although I have done this, I by no means wish to be understood as recommending no attention to be paid to concomitant flexions in cases of the kind. On the contrary, the cure will generally be materially assisted by properly adjusted pessaries worn in the interval between the intra-uterine medications. Formerly I was in the habit of using probes of whalebone, which had a certain elasticity, and could be made very slender. These I have now quite discarded for the probes of flexible metal, on account of the property the latter possess of retaining the shape into which they are bent. The first step is to wrap the probes smoothly and evenly with cotton wool, and this requires some little practice to effect satisfactorily, the object being to surround the probe with a fine layer of wool so smoothly applied as to add but little to its bulk, and yet so firmly as to avoid all risk of its being detached when used. This is best done by taking a very small quantity of fine cotton wool, which is teazed out and flattened between the hands until it forms a layer of uniform thickness. The probe is then dipped in water to cause the wool to adhere, and then is wrapped round by rotating the handle, while the metallic portion with the layer of wool is held between the finger and thumb of the left hand. Two or three trials will enable you to do this easily, and when it is well done the cotton adheres so firmly that you will find it impossible to remove it unless by cutting it off, and so smoothly and evenly that the probe with the cotton applied is hardly thicker than it was before. If, however, it is clumsily and badly done, you may defeat your own object, by making the probe so bulky that it will no longer enter the os uteri. It is well to mount several probes in this way, some being required to wipe out the uterus and remove the adherent discharge, which might prevent the remedy coming in contact with the mucous membrane, and one which is dipped into the fluid application to be used.

We next expose the cervix by the speculum, which may be of any form we are in the habit of using. I confess my own preference for the ordinary Ferguson's glass speculum with a bevelled extremity, partly because none can equal it in illuminating power, and partly because there is a certain advantage in fixing the cervix in the extremity of the speculum. When

the duck-billed or bivalved speculum is used the uterus is so mobile as to increase the difficulty of passing the probes satisfactorily. The first step is to clean the cavity of the cervix and uterus with a dry probe. The discharge will generally be found to have that peculiar tenacity which is so characteristic of cervical leucorrhœa, and it may be necessary to use more than one probe before it is removed. If we have ascertained the exact direction of the uterus, and bent the probe to correspond with its axis, taking care to pass it in accordance with it—for example, with its concavity backwards if it be retroflexed—we shall have no difficulty whatever. I must here repeat what I have before said, that the os is invariably open and patulous in cases suitable for this method of treatment, a condition which materially facilitates the necessary manœuvres. A little difficulty may be experienced in getting the point of the probe through the external opening of the cervical canal, or rather in finding it, but none in passing it onwards when this has once been entered. The utmost gentleness must be used, and if we meet with any difficulty it is better to desist, and certainly we should never permit ourselves to overcome the obstruction by force. In fact, the mounted probe should be coaxed into the cervical canal, never pushed in, just in the same way that we pass the male catheter when it does not enter readily. As a rule you will find it perfectly easy to perform this little operation, much easier than it is in most cases to pass the uterine sound. You will constantly find that as a case improves under treatment, as the catarrhal discharge lessens in amount, and the patient's sufferings diminish, so does the difficulty of passing the probes increase. When this is found to be at all great the case will usually be so much improved as to render it no longer necessary to pursue the intra-uterine medication.

The cavity of the uterus being wiped out with one or more dry probes, a probe dipped in the fluid to be used (the superfluous moisture being first wiped off in the neck of the bottle, so that none may run into the vagina) is passed like the others, and moved gently about so that the uterine mucous membrane may be thoroughly coated with the application. Then, if there be extensive abrasion, or a granular condition of the cervix, this may be swabbed over with the fluid, and the operation is finished. If the manipulations I have described be performed gently and carefully, as they ought to be, they are practically painless; nor does the application itself produce any suffering. Of course, if they are done clumsily and roughly the patient will be hurt, just as she would be if the uterine sound were passed by a bungling and inexperienced hand. You may depend upon it, however, that if you pro-

duce pain the fault is yours. I prefer that all this should be done when the patient is in bed, and that she should rest quietly for some time afterwards; but I have constantly been in the habit of treating such cases in the out-patient room, and have now done so for several years, and no case has come to my knowledge in which any ill effects have followed. I am justified in insisting on my experience on this point, because the opponents of intra-uterine treatment ground their objections on its supposed risks and hazards; and if I have never yet met with a case in which I have had the least reason to regret using it, it is surely no groundless assumption to assert that these dangers are purely imaginary, provided always that the cases are judiciously chosen, and the necessary manipulations properly performed.

With regard to the particular application to be used there is much difference of opinion. A strong solution of nitrate of silver, a saturated solution of tannin in glycerine, strong tincture of iodine, a solution of chromic acid, and even fuming nitric acid, have all been used, and are all, no doubt, more or less useful. I have tried them all, except the last, but I have found a strong solution of carbolic acid so immeasurably superior in its effects to them all, that I now use nothing else, and have every reason to be satisfied with it. The solution I use is prepared as follows:—Just sufficient water is added to the pure crystalline acid to keep it in a permanently fluid state, and the liquid so formed is a thick syrupy fluid of a pale pinkish colour, containing eighty parts of acid to twenty of water. To this I add an equal quantity of glycerine. I have often used the pure fluid carbolic acid prepared as above, and still constantly apply it to the exterior of the cervix when that is extensively abraded; but for the interior of the uterus I prefer to dilute it with glycerine. The effects of the carbolic acid are really remarkable, and may readily be watched on external abrasions. The slighter forms of these may often be healed by a single application, while even the worst kinds of granular erosion will be benefitted by one or two applications far more than by double or treble the number of dressings with the solid nitrate of silver or tincture of iodine.

There are certain properties, too, possessed by carbolic acid, which render it preferable to all other caustics as an intra-uterine application. Neumann, of Vienna, has shown that when applied in a tolerably concentrated form, such as I use, it causes the tissues to shrink and mummify, but they never swell; nor does it ever produce an eschar as do the stronger caustics, such as potassa fusa, the acid nitrate of mercury, or even nitrate of silver. We can, therefore, use it freely with-

out any risk of producing contraction of the canal of the cervix, a result which has followed the use of other agents, and which is said to be one of the objections to Courty's plan of using the solid nitrate of silver. Certainly no case has come under my observation where the slightest approach to such a result has followed the use of carbolic acid. I have no wish to depreciate other agents which are used, many of which are no doubt very efficacious, but inasmuch as I have never yet met with a case which has resisted the application of the carbolic acid, I have practically come to limit myself to the use of that alone.

With regard to the frequency with which the application should be repeated, I think that it should never exceed once a week, less often in slight cases, always taking care to have three or four clear days before the expected advent of a menstrual period, and the same time after its cessation.

One practical point is worth remembering, as ignorance of it might lead to disappointment. It not unfrequently happens that the first, or even the first two, applications are followed by an increase rather than by a diminution of the discharge. This is probably due to the unaccustomed stimulation of the diseased mucous membrane; and it is merely a temporary phenomenon. Almost immediately after the second dressing the discharge begins to diminish perceptibly; while the external abrasions, if any exist, assume a more healthy appearance, and soon entirely disappear. Very soon also there is a marked change for the better in the general symptoms; the backache and general symptoms become less constant and distressing, the general health improves, and the menstrual periods, which are frequently over-abundant, become less in amount and duration. This improvement, in favourable cases, goes on steadily until the patient is quite restored to health. The length of time during which it is necessary to continue the intra-uterine applications varies, of course, in different cases. Sometimes one or two have sufficed to effect a cure; at others, in cases of long duration which have become thoroughly chronic, it may be necessary to continue the treatment for many consecutive months. It is impossible to lay down precise rules on this point; but I consider no case of old-standing uterine leucorrhœa to be thoroughly cured unless the morbid discharge has completely ceased, until the cervix and body of the uterus have assumed a healthy appearance and feel to the finger, the general condition is so far improved as to enable the patient to follow her usual avocation, and the morbid patency of the canal of the cervix is no longer evident.—*Lancet, Jan.* 4, 11, *and Feb* 15, 1873, *pp.* 3, 41, 230.

89.—ON THE VARIOUS MODES OF APPLYING REMEDIES TO THE INTERNAL SURFACE OF THE UTERUS.

By Dr. Robert Barnes, Obstetric Physician to St. Thomas's Hospital,

[Topical applications to the diseased mucous membrane of the uterus, are essential to cure in many cases of uterine disease; but, in the form of injected fluids they are not free from danger. There have occurred numerous cases of accidents attending the use of intra-uterine injections, varying from severe pain to shock, collapse, metritis, perimetritis, and death.]

To avoid the dangers of intra-uterine injections, several precepts have been enjoined. The great object aimed at is to avoid or lessen the risk of the fluid running along the tubes. This it is sought to attain—1. By securing free dilatation of the cervix uteri before injecting, so that the fluid may readily run back into the vagina. For this purpose the preliminary use of laminaria-tents is advised. 2. By using only graduated quantities of fluids and injecting very gently and slowly. 3. By using a double canula, so as to secure a return current. To effect this the more surely, the openings of the canula at the uterine end are made at different levels.

I have not much faith in the double canula. The end which should serve for the return-current is liable to be choked. The preliminary free dilatation of the cervix, and the use of gentleness in propelling the fluid, should never be omitted: but I do not believe that the observance of these precautions is an absolute guarantee against accidents. It is probable that the mere forcible impact of any fluid striking upon the inner surface of the uterus, especially upon the fundus, may cause severe pain and prostration. Since nothing is gained by forcible injection, this consideration affords additional reason for injecting with all possible gentleness; hence it is well to use injecting-pipes having lateral opening of very fine calibre, so as to "pulverise" the liquid.

I strongly advise not to use injections at all in cases of marked flexion of the uterus. Even if we dilate the cervix first by tents, and maintain the uterus erect during the injection, we cannot always be sure that the flexion will not be reproduced, so as to prevent the issue of the fluid; and it must not be forgotten that it is especially in these cases that the uterine cavity is likely to be enlarged, and the Fallopian tubes dilated.

The general conclusion at which I have arrived, is to restrict the use of intra-uterine injections within the narrowest limits. I rarely employ them now, except in cases of urgent danger from menorrhagia.

We may obtain almost all the advantages that injections are capable of giving by other means. For example, the same agents which are useful in the form of solutions for injection, may be employed either by swabbing, or solid, or in the form of ointment. Thus, where the use of chromic or nitric acid, or perchloride of iron, or iodine or bromine is indicated, these agents can be applied soaked on a sponge or piece of cotton, or on a glass- or hair-pencil—the cervix having previously been well dilated. Nitrate of silver is far better applied in the solid form: even then it is liable to cause severe colic. The risk of this may be lessened by reducing the caustic, by fusing it with an equal part of nitrate of potash. The ordinary way of using the solid nitrate of silver—that is, by holding a piece of the stick in a forceps or porte-crayon—is objectionable. The piece may fall out or break, and a fragment left behind in the cervix or body of the uterus may give rise to intense agony, and even metritis. To avoid this accident, I have for many years adopted a contrivance I learned from Sir Benjamin Brodie, who armed the ordinary probe by dipping the end into nitrate of silver, fused in a watch-glass over a spirit-lamp. I use special probes of platinum of silver, mounted on handles of convenient length. These probes may be curved to follow the course of the uterine canal. This is far the best way of applying nitrate of silver to the os and cervix uteri; and it is the only safe way of applying it to the interior of the uterine cavity. The armed end of a probe may be passed into the uterus without the speculum, although the aid of this instrument is sometimes convenient. For example, unless the armed probe be protected by a canula, the caustic will first touch the vulva and vagina in its passage, which is apt to leave unpleasant effects, and the guiding finger of the operator will be stained.

One of the most widely useful topical applications to the mucous membrane of the cervix and body of the uterus is sulphate of zinc. The value of this agent, when applied to the relaxed or morbid mucous membrane of the vagina in the form of injections, is familiarly known: how to apply it to the uterine mucous membrane is, therefore, a matter of great interest. This has been accomplished by Messrs. Johnson, the well-known assayers, on the suggestion of Dr. Braxton Hicks, who prepared small cylindrical sticks of fused sulphate of zinc weighing three and five grains. These can be carried quite into the uterus without having touched the vagina by the way, by means of a canula, first made on my design by Messrs. Weiss, and now generally sold by instrument makers. It consists of a silver canula of the size No. 8 or 9 catheter, gently curved, open at the end, and supplied with a stilet or piston. The stick of sulphate of zinc or other material is placed in the

uterine end of the canula; the instrument is then passed into the uterus just as the uterine sound is passed, the patient lying on her left side; and the operator's finger, placed on the os uteri, guides the instrument. It is a great advantage of this contrivance that the use of the speculum is quite unnecessary after it has aided in establishing the diagnosis which supplies the indication in treatment. When the instrument has gone the proper depth, the piston pushes out the stick, and the instrument is withdrawn, leaving the stick to dissolve. This it soon begins to do, and, by its speedy effect in constringing the mucous membrane, it keeps itself *in situ* until it is completely dissolved.

Nitrate of silver, reduced by admixture with nitrate of potash, may be used in the same way; so may persulphate of iron, but this should be considerably reduced. When used nearly pure, I have known it cause severe colic and bleeding.

A most precious way of applying astringents, caustics, solvents, or alteratives to the interior of the uterus, is in the form of ointment or pasma. In this way almost any substance can be applied. Where grease is objectionable as a vehicle, a pasma of suitable consistence may be made by aid of glycerine or other matters. In this form we may use substances which cannot easily be applied in any other way. For example, we can hardly use bromine, or iodine, or mercury, in a solid shape, and to use them in liquid form is open to the objections already discussed. Almost anything can be made into an ointment or pasma, and thus we get a complete practical command over a large range of useful agents.

To introduce ointment into the cavity of the uterus, Messrs. Weiss have made from my design a very convenient instrument, also capable of being used like a sound without the speculum. The instrument is easily charged by dipping it into the ointment —a sufficient quantity of which is carried into the uterus, and, by pushing up the piston, is deposited there.

If it be desired to apply a powerful liquid caustic, as chromic acid or strong bromine, to the interior of the uterus, this can be done by the ointment-carrier. A few shreds of asbestos may be packed in the space between the eyelet-holes and charged with the fluid. On ramming down the piston, the fluid will be squeezed out.

In discussing the action of powerful styptic injections in arresting flooding after labour, the conditions under which the practice I have recommended is indicated have not always been accurately appreciated. The great agent, of course, in stopping hemorrhage, is the constriction of the uterine vessels by the muscular wall in which these vessels run. All the ordinary means of arresting hemorrhage are aimed at producing mus-

cular contraction. But muscular contraction depends on nervous power. Thus cold, grasping the uterus, introducing the hand, galvanism, all depend for their efficacy upon the spinal cord being able to respond to the peripheral call. When, therefore, these means prove sufficient, the inference is *generally* warranted that the case, although serious, is not desperate. The condition is very different when the excito-motor function is suspended; when neither by peripheral excitation, nor by centric stimulus, the nerve-force can be drawn or sent from the spinal cord to the uterus in sufficient intensity to cause contraction. At this point, unless the bleeding is arrested by syncope, or by temporary enfeeblement of the circulation, the patient is in the most imminent danger of death. The slightest shock or disturbance will extinguish the flickering spark of life. Under such circumstances I have known death follow, to all appearance immediately caused by, the injection of cold water, or passing the hand into the uterus. If, instead of cold water, we inject a solution of perchloride of iron, the same catastrophe may ensue. Is it more likely to ensue? Very careful observations are required before this question can be answered in the affirmative. People are apt to think that cold water is so simple a thing that it cannot do any harm. But if it cannot do any harm, is it not probable that it is, under the conditions discussed, equally powerless to do any good? Harmless remedies, as a rule, fail in great emergencies. Now, cold water fails not because it is harmless, for the shock and depression which it causes are extremely dangerous; but it fails because, nervous power being exhausted, it cannot excite uterine contraction, and it has no other virtue in arresting hemorrhage.

Here, then, it is that styptics come to the rescue. The emergency is extreme, and would be desperate, but for the new power invoked. If blood be still running, it is instantly seized at the mouths of the vessels, which become sealed up by coagula. It also constringes the inner surface of the uterus, and thus further closes the vessels. The system then has time and opportunity to rally, and by and by the contractile power returns. In estimating the relative value, then, of cold water and perchloride of iron, we must reflect that iron acts and saves life when water is inert or injurious. If occasionally death follows, and is apparently accelerated by, the iron injection, we have, on the other hand, to remember that it was used as a last resource, when the patient was likely to die even if nothing were done, and that even under these unpromising conditions *many lives, to all appearance doomed, have been saved.*

The great lesson to learn is to take courage to use the styptic in time; that is, before the vital power has sunk too low. It

was not to be expected that a remedy powerful enough to save under the last extremity should be altogether free from danger. But I have seen so many women bleed to death, and have seen so many saved by the timely use of the iron injection, that I am much more afraid of the bleeding than of the remedy.

In some cases, there is reason to believe that the iron enters the uterine vessels. I have known intense pain in the uterus follow immediately on the injection. How is this explained? If blood were present in the vessels, it is a chemical necessity that contact with the iron would cause coagulation. I infer, then, that in some cases the vessels are for a time nearly empty; and that there is a certain amount of suction-action induced by the relaxed state of the uterus, and by the lateral or semiprone position of the patient. I would therefore urge that the patient be placed on her back, and that the uterus be grasped firmly between the two hands of an assistant during the injection.

In some cases, it is easy to carry a swab of sponge soaked in the iron solution into the uterus. In this way probably some of the risk attaching to injection is avoided. The persulphate of iron, which is preferred by our American brethren, may have its advantages. Its styptic force is probably greater. It may be used in the form of one part of the liquor ferri persulphatis of the British Pharmacopœia to six or eight of water. The proper strength of the perchloride solution is one in ten.—*British Medical Journal, Jan.* 11, 1873, *p.* 31.

90.—ON OVARALGIA.

By Dr. T. Clifford Allbutt, Physician to the Leeds General Infirmary.

If gastralgia be mistaken for dyspepsia, far more commonly is ovaralgia misunderstood. Indeed, the existence of ovaralgia, as I understand it, is by no means familiarly known to the profession.

The irritable uterus of Gooch was, and perhaps is, a phenomenon of which few medical men would be called ignorant; but I am sure that it a very different thing to the ovaralgia of which I have seen many marked examples. I cannot say that uterine neuralgia is an ailment which has come very prominently before me, though, as all our experience is accidental, it may well be common for all that. Women, however, in my experience such as it is, complain to physicians far more often of unilateral pains and pains which are evidently periuterine, than of pains which are actually seated in the womb itself. For it is not quite accurate to give the name neuralgia to those

uterine pains and irritations which accompany other disorders of that viscus. All the uneasiness and misery which result from displacements and from local diseases, such as ulcers or tumours, must of course be eliminated. Cases of irritable uterus, again, cannot be called cases of neuralgia proper, for in almost all of them there is also some menstrual disorder, or the pain attends the normal menstruation, when the necessary congestion burdens and irritates the hyper-æsthetic tissue. In this view I am supported by the valuable opinion of Dr. Handfield Jones, and he will, I think, wish with me to preserve a distinction between hyper-æsthesia and neuralgia. In my selection on gastralgia I have spoken likewise of gastric hyper-æsthesia as occasionally implicating gastralgia, but it is not gastralgia ; on the contrary, I have notes of many interesting cases of pure gastric hyper-æsthesia with which gastralgia was never associated, and which rather simulated ulcer or chronic gastritis. To turn also to the ovaries themselves, there is such a thing and a common thing too as hyper-æsthesia of the ovaries, but this differs entirely from ovarian neuralgia, as I should describe it, in which the ovaries need not be very tender to pressure, though of course they sometimes are so continuously and often are so soon after an attack of pain. In ovaralgia there is often no disorder of function whatever, but acute aching or, it may be, agonising pain. This pain, when severe, is too often mistaken for urinary calculus, lithiasis, or even for peritonitis. This latter is a sad blunder, but I fear far from rare, if I may add my own observations to the warnings of Dr. Addison, who, says Dr. Jones, "appreciates fully the difficulty there may be in distinguishing abdominal neuralgia from peritonitis." The ovarian neuralgia to which I refer comes on either as a mere weight or burning, or as a true 'tic.' As in the case of Mrs Mc——, it often comes in a moment and continues as an agonising paroxysm for one or several hours. The pain may dart from the ovary of one side, often thence downwards towards the perineum or upwards to the false ribs even to the arm pit, though sometimes we have to allow for a little exaggeration in descriptions of severe pain. The pain rarely occurs in both ovaries at once, though it frequently attacks them alternately. The occurrence of the pain does not seem to depend upon any well defined immediate cause, for it may occur at almost any hour of the day. Indeed, its demeanour is in every respect very like that of ordinary facial tic. There need not be and often there is no coincident local disorder of any kind, though a local cause of irritation—such as ascarides, for example—no doubt might determine an outbreak. At the same time I think sexual excitement may not infrequently be accused of some complicity in the attack. This is a subject on

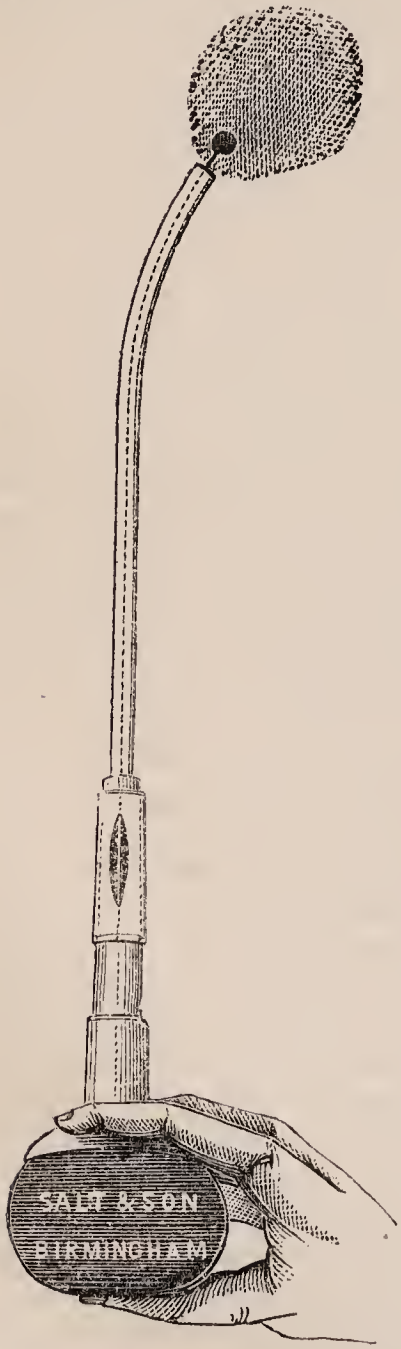
which clinical questioning is almost impossibe but I have seen severe uterine neuralgia twice in newly married women, and once in a married woman who was believed by her own medical adviser to make great claims upon her husband. That the immediate cause of the attack in a predisposed person was in another instance the combined influence of cold and fatigue seems clear. As mastication again may bring on facial tic, and food may bring on gastralgia, so ovaralgia is often produced by quick walking or running. Ovarian ovaralgia will need the same general treatment as the other neuralgias; quinine and steel being more especially useful. As a palliative measure hypodermic morphia has the same marvellous value that it has in gastralgia and in every other form of nerve pain. But year after year adds to my conviction that the remedy is as dangerous as it is effectual. In a paper published some time ago in the Practitioner I drew attention to the unquestionable fact that the use of the morphia syringe tended even more surely to become a habit than the use of anodynes in other modes and forms. Those who have learnt to fly to the syringe, as a remedy from instant pain, soon discover that in it they find also a most effectual stimulant. Delicate ladies, when under the influence of the injection, can stir about their houses, can frequent dinners and balls, can receive company at home and feel generally hungry, active and gay, to a degree before unknown to them. Hence its terrible fascination for them, a fascination which seemingly is as potent when once established as that of alcohol. Like alcohol, too, it creates the recurring need for its repetition. The dose may not be greatly increased, the sixth of a grain may not grow to more than half a grain or a grain, but the system claims it again and again, and denial seems cruel or even impossible. When the influence passes away a state of depression seems to come on,—a want, a sense that the lamp of life must be re-trimmed, and many persons have not the strength to resist this. Not only so, but this very reaction becomes the cause of a renewal of the neuralgia, so that the morphia treacherously keeps alive the very pains it pretends to relieve. A lady of great intelligence, and a great sufferer from neuralgia, told me that she discovered the temptation of morphia injections after the first half-dozen operations, and she decided to bear pain rather than run the risk of becoming a slave to them. Among numberless cases of a contrary kind I may mention one of a brave lady, a sufferer from intense cervico-brachial neuraglia and habituated to the use of the syringe, who, in obedience to our urgent wish, broke the habit, and the pain gradually ceased to return. On the other hand a medical friend, who lives away from Leeds, told me that a lady stopped him one day in the street, and begged him to give her an injec-

tion in his brougham, as her syringe was broken and her own medical man was out of town. This lady was not at the time suffering from actual pain and, much to her displeasure, he declined to operate. Therefore I would warn my readers not under any circumstances to permit the use of morphia in this way to become periodical, or they will find the last state worse than the first. In old persons with neuralgias that are admittedly incurable the periodical use of hypodermic morphia may, as Dr Anstie argued in a review of my paper, seem the lesser of two evils, and may not indeed be any great evil; but in younger persons it should be discountenanced for two reasons, namely, 1, the regular use of it sets up a periodicity in the system which actually favours the return of pain; and, 2, during that regular use all other treatment loses much or all of its power. Case after case has come before me, of late years, in which I have seen, not only the establishment of a periodic pain in spite of all remedies, but also, in addition to this, a love of intoxication, with slow and almost imperceptible deterioration of mental stability and calm intelligence which has defied all management. Several brave persons suffering from gastralgia, hepatalgia, facial tic, ovaralgia, &c., &c., at my urgent entreaty have broken off the habit, and in these cases, without any special treatment the neuralgia has *pari passu* given way likewise, while it had previously defied even the continuous current. Therefore I feel very strongly opposed to the regular use of this potent remedy by neuralgic persons. It should not, generally speaking, be taken out of the hands of the medical attendant, and it should be used avowedly as a palliative on special occasions only, not at regular intervals. I need scarcely say that hypodermic morphia often cures neuralgia, and to this end may well be used for a few days consecutively, or several times a week. Still, the medical man must assuredly bear in mind that, if he does not cure the ailment, he is in danger of establishing a habit both of intoxication and of the neuralgia itself. With him the responsibility must rest of drawing the line between its use as a curative means and its use as an habitual palliative and stimulant. The same difficulties which have limited my experience of the continuous galvanic current in gastralgia, apply with even more force to ovaralgia, in which complaint I have indeed never made a trial of it. Fortunately, so far as a few cases can prove, we seem to have in quinine, liberally given, an almost specific remedy. It may not act more decidedly in ovaralgia than it does in trigeminal tic, but, curiously enough, it is at least equally valuable. In iron and arsenic then, as chronic remedies, and in quinine or hypodermic morphia, as immediate remedies, we may find a tolerably sure cure.—*L'pool and Man. Med. Reports*, 1873, *p.* 119.

91.—NEW INSUFFLATOR FOR TREATING DISEASES OF THE UTERUS.

By John Clay, Esq., Obstetric Surgeon to the Queen's Hospital, Birmingham.

Having used the insufflator (see Lancet, Nov. 30th, 1872) in a number of cases of diseases of the uterus, and proved its thorough efficiency in every respect, I have had an engraving of the instrument made, which I here introduce, together with a description of the mode of using the instrument.



The instrument is made of the same length and shape as Simpson's uterine sound, and after the model of the "alum puff" used for insufflating the larynx; but instead of having an open end, which would render it liable to be plugged with mucus during its introduction into the uterus, and which would prevent the escape of the powder, the instrument here depicted is provided with a movable bulbous head, which closes the end of the tube. The pressure of the thumb on the rubber ball opens the end of the tube and ejects the powder at the same time, as shown by the engraving. When the pressure of the thumb is removed from the ball, an internal spiral spring retracts the bulbous head, and thus facilitates the withdrawal of the instrument.

The powder is placed in the aperture seen at the lower end of the tube, near to the rubber ball, and is secured by means of a sliding ferule not shown in the engraving.

Messrs. Salt and Sons, Birmingham, surgical instrument manufacturers, have been very successful in producing a neat and efficient instrument.—*Lancet, Feb.* 1, 1873, *p.* 166.

92.—INTRA-UTERINE INJECTIONS.

By Dr. J. Whitehead, Physician to the Children's Hospital, Manchester.

In the British Medical Journal [see Art. 89, p. 336] Dr. Barnes has treated, with skill and judgment, a subject in pathology of considerable importance. Chronic endometritis, with uterine catarrh, is by no means of uncommon occurrence, and is a frequent cause of a distressing form of dysmenorrhœa, as well as of sterility, especially in early married life, but also at a later age.

Somewhat more than twenty-seven years ago a case occurred to me illustrative of some of the inconveniences which Dr. Barnes mentions as liable to happen in the treatment of such cases. A patient in private practice, six years married and without progeny, laboured under yellow vaginal discharges and membranous dysmenorrhœa, which I had reason to believe to be of gonorrhœal origin. After a prolonged treatment by vaginal injections and constitutional remedies with no beneficial effect, I found, on specular inquiry, an extensively denuded and granular state of the lower section of interior brought into the field of view. To this surface I applied a strong solution of nitrate of silver (one drachm of nitrate three drachms of water) on saturated lint, and maintained this *in situ* by additional dry lint pushed up through the speculum. In the space of two or three hours later I was urgently summoned to the patient, and found her labouring under most violent pains of the abdomen, which soon became tympanitic and exquisitely sensitive to the touch. Opiates were freely given, and fomentations and poultices used throughout the night; at early morning the pain was mitigated and she slept. In the course of two or three days all the troubles disappeared, and she was restored to her customary health. Pregnancy took place within five or six weeks after this event, and was followed by two more pregnancies, all equally successful. I felt no doubt that the solution of nitrate of silver had been transmitted, by ciliary action, through the uterus and along the Fallopian tubes to the abdominal cavity.

Feeling encouraged by the result obtained in the preceding case, I injected shortly afterwards, in two similar cases, by means of a catheter syringe, a small quantity of the same solution within the uterus; and in both had like disturbances—being obliged to keep the patients under active treatment in my own house for two or three days with the aid of other professional counsel. Both patients, however, did well; both were cured of uterine trouble; and both bore children.

These cases, however, although satisfactory in the issue, were much too troublesome, if not dangerous. I have therefore since adopted the plan of injecting, by a graduated catheter-syringe, no more than twenty or thirty minims of a much weaker solution, viz., a grain and a half to the ounce; and the moment this quantity has been introduced, I quickly draw back the piston of the syringe so as to bring away all the fluid that is not immediately absorbed. Under this plan I have not had an unfavourable symptom—with the exception, perhaps, of a little uterine tormina of short duration, and almost always a satisfactory result.

I have witnessed as severe peritoneal suffering from the injection of pure cold water as from the strong nitrate of silver solution; but water at a temperature of 100 deg. F. does not occasion distress beyond a sense of tormina of a few minutes duration. It is evident that fluids injected within the uterine cavity—even *without force*, and in small quantity, may mount by ciliary action through the Fallopian tubes into the peritoneal cavity with great quickness. The cold water injected on two occasions in very small quantity, the piston of the syringe being quickly withdrawn, could not have lost more than one or two degrees of its coldness before entering the peritoneal cavity, and its presence there was manifested in less than thirty seconds.

But of late years I have nearly abandoned injections into the uterus. I find it better and safer, and attended with much less trouble, when treating chronic endometritis, to apply remedies by means of Lallemand's porte-caustique. This instrument, although intended for the male urethra, is quite as useful for the female in cases of endometritis. The groove of the stilette, charged with an ointment of nitrate of silver of suitable strength, or with axunge, the surface of which, covered with finely powdered nitrate of silver, sulphate of zinc, perchloride of iron, or any other remedy, being drawn into the canula, can be safely introduced through the first passages. On arrival within the uterine cavity, the stilette must be protruded and rotated by manipulation of the handle, by which means the remedy is brought freely into contact with all the surfaces of the cavity. This part of the process should be done slowly, in order to allow the charge in the groove to melt and lubricate the whole interior of the organ.

In my experience, this mode of application of remedies to the interior of the uterus has not been followed by any metritic or peritoneal disturbance whatever, and frequently has resulted favourably.—*British Medical Journal, Feb.* 1, 1873, *p.* 115.

93.—GUAIAC IN OVARIAN AFFECTIONS.

By Professor Cleland, F. R. S., Galway.

[Guaiacum is a remedy which formerly enjoyed more reputation than it now does.]

I have now used it for about two years in cases of amenorrhœa, and in inflammatory affections of the ovaries. One of the first cases in which I tried it was an ophthalmia in both eyes in a girl of seventeen. It baffled all local treatment: twice I clipped the conjunctiva for pannus, but with only temporary advantage. At last, after it had continued for months, believing that the disease might depend on the non-appearance of the menses, of which the patient had only once in her life seen any indication, I gave resin of guaiac in ten-grain doses daily, and had the satisfaction of seeing the patient soon leave the hospital perfectly well, without any other treatment. Since that I have frequently used the same prescription for amenorrhœa, and sometimes with marked success. Thus, within the last fortnight I saw a girl of fourteen, who had been under my care before for acute synovitis of the knee joint, excited in the first instance by a slight wound from an ivory crotchet needle. There had been more than one relapse, and on this last occasion the inflammation had been allowed to become so violent that suppuration took place, and I was obliged to establish a drain. Having regard to the tall flabby appearance of the girl, and the slightness of the original irritation, I thought it probable that the state of her constitution at her age might have something to do with the disease of the joint. I ordered her ten-grain doses of resin of guaiac daily, and she only had taken four of them when her first menstruation come on. The knee progresses favourably, and the patient's general appearance is improved. No doubt, it may be alleged that both in this and the previously mentioned case, the supervention of the menses on the exhibition of the remedy may have been mere coincidence; and so perhaps it might; but when such coincidences happen frequently one learns to believe in the remedy.

Quite as remarkable are the effects of guaiac in ovarian affections of inflammatory origin. I remember one instance in which the patient had been for years suffering from severe attacks. When I was called in, the pain in one side was acute, preventing sleep; leeches were applied, and bromide of potassium given; and, when that failed, a course of arsenic was resorted to with good effect, setting the patient on her feet. But, on an opportunity occurring to make inquiries, more than a year after, I found that her health was by no means quite re-established, and that there was still the debility and pain in the back, characteristic of sexual derangements, and making

life miserable. Guaiac was ordered; and the next time that I met the patient's mother her gratitude was great, as she told me how her daughter had got so suddenly perfectly well. I might mention other cases in which the effects of this remedy have been quite as marked; but, my position is this: that, while I have seen enough to convince me that it is my duty to mention to others, who have better opportunities of testing practical points, a neglected action of an old remedy, I have not myself sufficient opportunity properly to investigate the laws which regulate that action. Taking, however, into account the cases in which I have tried guaiac without seeing any effect, I conclude that it is useless in acute cases, and in those in which the primary disorder is situated, not in an ovary, but in the uterus. I have never seen any great benefit from guaiac where there was a marked affection of the cervix uteri; but I have often seen it act where there was great pain and weakness in the back complained of, and even slight leucorrhœa.

I usually order guaiac in doses of ten-grains of the resin every morning; but that amount is sufficient, with many patients, to produce diarrhœa after it has been continued for a few days; it is, therefore, well to prepare the patient for that happening; and as there seems to be no connexion between the therapeutic benefits and the action on the bowels, she may be directed to take only one every second day if diarrhœa is threatened.

I may mention that I was led to try the effect of guaiac in ovarian cases in a curious enough way. It had been brought under my notice by a medical friend, for whose opinion I have great respect, that it had great virtue in cases of persistent sore throat; and this I found to be true. I then remembered the old belief, not altogether groundless, of a sympathy between the tonsils and the testes or ovaries, and that induced me to experiment.—*Irish Hospital Gazette, Jan.* 1, 1873, *p.* 6.

ADDENDA.

94.—ON METHYLENE ETHER OR ETHYL.

By Dr. Benjamin W. Richardson, F.R.S.

Since my announcement of the introduction of methylene ether as a general anæsthetic, the vapour of this fluid has been administered by many practitioners with so much satisfaction that a word or two more may now, I think, be said of it with advantage. Its physical properties, its physiological action, and its practical utility are the points on which I would briefly treat.

I first made the solution I now call methylene ether, or ethyl, in 1869, and I administered it in several cases for short surgical operations. I was struck then by the regularity of its action, but I looked upon it as a mere mixture of two fluids having very similar physical qualities, and I let it pass with little further notice until last year, in order to search for a fluid possessing similar physiological properties and simple in construction. Returning to what I still supposed to be a mixture of two distinct fluids, I described the effects of methylene ether, as a mixture, in a previous number of this journal. It has been proved since that the fluid is not a mere mechanical mixture of two fluids as originally supposed.

In order to insure a definite compound, I requested Mr. Robbins to mix absolute ether of specific gravity ·720, and pure bichloride of methylene of specific gravity 1·340, in an estimated proportion of each, so as to insure a specific gravity of the combined fluids of 1·050. In endeavouring to accomplish this Mr. Robbins observed that he could not get the required gravity from the proportions of the fluids respectively employed, although the result ought to have been as expected, by calculation from their weights. Mr. Robbins observed, further, that on mixing the two fluids there was a rise of temperature amounting to 21·5° Fahr. when equal parts of the fluids were blended.

A few days afterwards Dr Archbold reported to me independently that he had observed a similar fact in reference to the gravity of the combined fluids, and he added that upon distilling the mixture, made by adding together absolute ether and methylene bichloride, over chloride of calcium, a deposit of

carbon, with water, was left in the retort. He further found that the fluid he had distilled over was free of oxygen, so that it failed to act on potassium, The facts thus obtained indicate that when methylene bichloride and absolute ether are mixed there is produced a new chemical combination, probably a combination of the radical ethyl (C_4H_{10}) with methylene bichloride (CH_2Cl_2). A specimen made in the manner described, and which I have recently used, has the specific gravity of water (1000); it begins to boil at 90° Fahr., boiling steadily and equably; it shows a very feeble action on potassium; it possesses an odour entirely distinct from ether; it is much less pungent than chloroform or methylene bichloride; and it is but little irritating when applied to the surface of the skin.

The physiological action of methylene ether of the quality thus named is an improvement on that which I originally employed. It is very rapid in producing effect. From one to two fluid drachms will induce, in the space of a minute and a half to two minutes, sufficient insensibility for a short operation, while from two to six drachms are sufficient for the production of prolonged anæsthetic sleep. The sleep induced is gentle, and is very rarely attended with convulsive movement. The pupil undergoes very slight variation, as a rule, but is sometimes a little dilated when the narcotism is deep. Vomiting is less frequent than from chloroform, methylene bichloride, or ether; it does exceptionally occur, but is of brief duration.

When in an inferior animal the administration of methylene ether is carried to an extreme, it is difficult to decide which function fails first—that of circulation or respiration. I think the respiration fails first; at all events, respiration may be brought to a standstill and yet the animal may be easily made to recover by artificial restoration of the function.

Practically, methylene ether bids fair to hold a permanent place in surgery. Mr. Lawson Tait has now administered it thirty-three times for long operations, and has had but two instances of vomiting in all. He finds the anæsthesia produced by it to be deep, calm, and effective, easily brought on, and quickly and easily recovered from. In all respects, in a word, his experience of it accords with my own.

From the physical characteristics of methylene ether, and from its physiological properties, I should infer that fewer deaths will occur from its use than from chloroform or even methylene bichloride, and that it may prove equally safe with common ether, over which it possesses, as a practical agent, all the advantages of chloroform and of methylene bichloride. I do not claim for methylene ether that it is absolutely safe, for the possession of a general anæsthetic devoid of all danger,

though it will, by infinite labour, be one day discovered, is as yet only a delusion of idle, untaught minds. I shall make no apology for methylene ether if it prove occasionally unsafe; but I submit it simply as a rational advance in anæsthetics, for the profession "to well and truly try."—*Medical Times and Gazette, Feb.* 15, 1873, *p.* 164.

95.—METHYLENE ETHER AS AN ANÆSTHETIC.

By Lawson Tait, Esq., Surgeon to the Hospital for Women, Birmingham.

By the introduction of this new anæsthetic, I feel sure that the days of chloroform as an anæsthetic for any but obstetric operations are numbered. The new substance has the following advantages over chloroform. Its action is much more rapid, and is entirely free from the muscular and cerebral excitement often seen in the use of chloroform; the quantity used is less; and sickness after its use is most exceptional, the recovery from the anæsthesia being extremely rapid and complete. Over sulphuric ether it has the advantage, that it is very pleasant to take, and that a tenth or twelfth of the quantity is sufficient.

I have used it about thirty times, and in only one instance was there any sickness, and it that case the lady had just before the examination been partaking freely of underdone mutton.

I have performed the following operations under its influence within the last six weeks, and in no instance has there been any sickness due to the methylene ether. A simple ovariotomy in which only three drachms of ether was used; successful. Removal of both ovaries, in which the amount used is uncertain, but was probably about four drachms; successful. Removal of the fundus uteri and both ovaries; a long and tedious operation, in which about two ounces of the ether was used, and in which no bad symptom has yet appeared (fourth day). This patient was sick some hours after the operation, but that was due to morphia. A long and tedious operation for retained menstruation, in which seven drachms were used; successful. I have placed this patient under the influence of the ether eleven times, and she has never been sick. This repeated administration is for the passage of the finger up to the cervix, and the whole process, including the complete recovery from profound anæsthesia, never takes ten minutes. Removal of a large fibroid, and, in the practice of my colleague, Mr. Ross Jordan, the removal of the fœtus from the broad ligament successfully, together with several minor

operations, and its administration for the purposes of uterine or vesical examination, complete my experience of this new anæsthetic; and I shall use no other for surgical work until I obtain some disastrous result, a misfortune that at present seems more unlikely than by the use of either ordinary ether or chloroform. I may add that its use is more economical than that of either ether or chloroform.—*British Medical Journal, March* 8, 1873, *p.* 254.

96.—PRACTICAL OBSERVATIONS UPON ETHER AS AN ANÆSTHETIC.

By Dr. Charles Bell Taylor, Surgeon to the Nottingham and Midland Eye Infirmary.

[Alarming collapse occurred in the case of a gentleman upon whom Mr. Taylor was about to operate for cataract, before insensibility was completely induced by chloroform. In consequence of this, various attempts at production of anæsthesia by ether were made in other cases with the object of testing the applicability of it to this particular case. All results obtained were more or less unsatisfactory.]

It was not until I had the pleasure of meeting Dr. Joy Jeffries, of Boston, at the College of Physicians, on the occasion of our Ophthalmological Congress, that my difficulties respecting ether were overcome. The information that gentleman was kind enough to convey to me I propose now, after an experience of upwards of 100 cases, to make known to the profession.

The ether must be pure, and what is termed anhydrous, of specific gravity 720, and it may either be administered by a very ingenious apparatus devised by Professor Morgan of Dublin, or after the practice of Dr. Joy Jeffries by means of a napkin or sponge. As soon as the patient has reclined in a position suitable for operation I cover the mouth and nostrils with a cone-shaped sponge, such as may be seen in any druggist's shop, and then direct the patient to cough, take a deep breath, and fully inflate the lungs. As soon as he is doing this satisfactorily I pour over the summit of the sponge an ounce or more of ether, and carefully, with both hands, preclude the admission of air from the sides. All that is further necessary is to encourage the patient to breathe freely, and to keep on adding ether without stint. If excitement comes on the sponge should be held firmly, and the dose of the anæsthetic increased. As a rule, insensibility is in this way speedily induced. Indeed, one of my colleagues who saw it for the first time decided that the effect was produced quicker than

with chloroform, an opinion in which I did not concur. If the patient breathes stertorously or becomes blue in the face, or any blood that may be flowing assumes a dark tint, the sponge should be removed for a few seconds, not longer, as recovery is rapid, and time will be wasted if air is admitted. As a rule, throughout the administration, the pulse keeps full and bounding, and the face is flushed. There is no collapse, pallor, falling back of the tongue, or other of those dangerous symptoms which we notice so frequently with chloroform or methylene. Speaking generally, also, it answers remarkably well in those cases where it is more specially indicated, such as in very feeble patients, worn-out marasmic individuals, and in children, as also in cases where prolonged anæsthesia is necessary.

The great danger in chloroform inhalation arises from failure of the heart's action—a risk from which, so far as I can judge, ether is absolutely free. Dr. Joy Jeffries considers that it would be difficult to cause death with ether even if anxious to do so—a conclusion apparently borne out by statistics, which show that while death has been attributed to ether once in 23,204 cases, chloroform has been credited with 1 in 2873. The smell of ether is disagreeable to patient and operator; I think it would be even injurious to anyone who is daily engaged in its administration; it is also persistent, and would be noticed at the street door of any house wherein it is administered. The drunken excitement, too, is objectionable, often developing itself in idiotic laughter, execrations, or psalm-singing. Vomiting occurs about as frequently as after chloroform. The patients often breathe with difficulty, raising the head and shoulders at each inspiration. It is difficult to obtain complete muscular relaxation with it; and the sponge or other apparatus, which cannot be removed even temporarily, is in the way of the operator in cases where the eye or face is concerned.

I don't think, for these reasons, that ether will ever take the place of chloroform; but it is unquestionably a valuable anæsthetic in cases where chloroform is inadmissible; and by using it in conjunction with that agent the danger of the latter is very much diminished. The best way of doing this is to administer ether until insensibility is induced, and then to go on with chloroform. The stimulant effect of the blood saturated with ether neutralises the depressing effect of chloroform. A dash of ether following chloroform has a similar effect, as Dr. Charles Kidd has pointed out; but I believe the former is the better course when danger is apprehended, and where the desired effect cannot be obtained by ether alone.—*Lancet*, *Dec.* 21, 1872, *p.* 879.

97.—THE DANGER OF CHLOROFORM AND THE SAFETY OF ETHER AS A MEDIUM OF PRODUCING INSENSIBILITY TO PAIN.

By Dr. J. Morgan, Surgeon to Mercer's and to the Westmoreland Hospitals, Dublin.

[The worst of the danger attending the use of chloroform is its suddenness and uncertainty. It is most likely to occur in persons not exhausted by disease, and while an operation is being performed where no immediate danger is at all to be apprehended.]

It may fairly be inquired, can a safer anæsthetic be ascertained, or one which will produce as perfect a state of insensibility without compromising the life of the patient? As I believe, on calm investigation, and on laying aside the prejudices which the habitual use of chloroform may arm us with against ether as an anæsthetic agent, that nevertheless ether furnishes arguments in its favour which are unanswerable, specially when the great question of safety comes to be considered. The American surgeons, and many on the Continent, prefer it as an anæsthetic, chiefly on account of its safety. Dr. Jeffries, in a paper at the late Opthalmological Congress, remarks that "it is almost impossible to kill a person by etherisation."

In an elaborate paper read by Dr. Coles on the subject at the Medical Society of Virginia, 1871, the following tabular result was found, when the statistics collected by Dr. Andrews in America, and by Dr. Richardson in England, were compared:—

Agent employed.	Deaths.	Inhalation.	Or
Ether - - -	4 to	92,815	1 to 23,204
Chloroform - -	53 to	152,260	1 to 2,872
Mixture of chloroform and ether	2 to	11,176	1 to 5,888
Bichloride of methylene -	2 to	10,000	1 to 5,000

Proving that chloroform is *eight times* more dangerous than ether, and is the *most dangerous* of all anæsthetics in use.

Attention to details is as essential to the perfect administration of ether as in many other procedures of importance.

The ether vapour should be freely applied. From its volatility this entails a certain difficulty, which I have succeeded in overcoming by a simple and efficient arrangement of an inhaler. This is made of a sufficient capacity to allow the diffusion of the ethereal vapour. It is furnished with a series of frills in the interior, which facilitate the volatilisation of the ether by its trickling over them; and the upper part of the inhaler is supplemented by an Inda-rubber diaphragm. An elastic tube conducts the vapour from the bottom (where, from its gravity, it descends), and a mouthpiece, filled with a water cushion

around, can be so aptly applied that but little air can enter. The elastic diaphragm allows the respiration to be carried on *within* the inhaler, while the ether vapour is constantly accumulating within, by evaporation. If the diaphragm be watched the respiration can be fully observed. At first it will be shallow, but gradually increase; and as anæsthesia supervenes, it will become more full and energetic; the more profound the anæsthesia, the more full will be the respirations.

Sensibility will, for the time, be extinguished; the patient will lie with the face somewhat congested, overwhelmed as it were with a deep sleep, and may snore; the eyes are usually open and slightly upturned, and the pupils usually dilated. This condition is perfectly manageable; the mouthpiece may be withdrawn for a time, and re-applied when signs of returning sensibility appear, or air may be admitted into the inhaler by a simple arrangement in turning the cap of the supply tube. I prefer taking away the mouthpiece and letting the patient breathe—should it again be required—the concentrated vapour from the inhaler.

It might be supposed that the frequent re-breathing of the same vapour would be impossible—this is not so. Whether from the diminished formation of carbonic acid, or from the fact that the diminished sensibility caused by the ether vapour, allows the breathing of the carbonic acid, or from both, the patient can re-breathe the same vapour over and over again. That a diluted form of carbonic acid is not so very dangerous is shown by the fact observed in the mining districts in Cornwall, for instance, where the work goes on in gangs; the foremost labourer, with a knowledge that he may become insensible, relies on his rear-rank companion to draw him out when he becomes so, which he does in due time, and steps on himself to undergo a similar ordeal, although a lighted candle would go out, and it was impossible to remain over ten minutes.

On reviewing the practice of the American surgeons more particularly, it will be observed that those practitioners—who are most solicitous in excluding air—report the best results, and assert, as the result of their experience, that "anæsthesia may be induced by means of ether as quickly as can safely be done by means of chloroform, and with a quantity weighing less, and costing very little more than the requisite amount of the latter;" at the same time it is observed that it is "endeavoured to prevent any, even the slightest, admixture of air." The nitrous oxide gas, which has gained some support as an anæsthetic, in like manner acts most efficiently when breathed without the admixture of air; and in various comparative observations I have made, by admitting and excluding a free mixture of air, I am satisfied that anæsthesia is more

perfect and more devoid of inconveniences when the ether vapour is freely taken in.

On comparing the effects with those of chloroform, where the patient is some time submitted to the influence, occasionally there is some excitement in strong or nervously constituted persons, and in men more especially; but it is nothing like that seen so often in chloroform inhalation, and very soon subsides. If the exhibitor stands behind the patient, and applies the mouthpiece equably and firmly over the *mouth and nose*, the condition will pass in a moment or two. It does not occur in many patients; and in whatever degree it shows itself, it indicates that the patient is on the verge of insensibility, and that the administration is to be pressed on; as Dr. Asshurst remarks, "if the patient breathes freely he cannot be too rapidly etherised, and there is no danger, as in the case of chloroform, from the vapour being too concentrated." In some cases this condition is simply shown by a withdrawing of the head from the mouthpiece, this also indicating that it is the most suitable time to press on the influence. It is to be remembered that during the first few inhalations the patient should be allowed a little time to become accustomed to the odour of the ether; but if ether be exhibited by the inhaler, as I propose, no struggling or spasmodic stage can, in the generality of cases, be of inconvenience.

Sickness of stomach is said to succeed to etherisation more than to the use of chloroform; my experience with both leads me altogether to disagree. The precaution should be taken that no food be ingested within two or three hours at least. I am sure the instances will be rare, indeed, where sickness occurs, if this simple rule be adopted.

Another objection, if it can be called one, that has been suggested is that of the odour of ether from the breath being so persistent. I have not found it after a few hours. But even if it lasted a week, it could not have a feather's weight influence in the consideration of using an agent which has been shown to be "*the safest of all anæsthetics*," and than which, chloroform, which alone can be compared with it in efficacy, is "*eight times more dangerous*."

I cannot avoid urging the question on the attention of the profession, when America, which has had a quarter of a century's experience with ether, prefers it as the *safest* agent, although, in my opinion, it has been hitherto but imperfectly used.

The use of the inhaler I have devised completely obviates all difficulties, and renders the use of ether, as an anæsthetic, applicable to all operations, whether large or small, and also applicable to all ages, with the incalculable advantage of offering

the greatest security that can be given by any of the anæsthetics known at the present day.

As to the matter of cost, about 2 oz. of ether suffice (by the inhaler), whereas a half-pint is frequently used otherwise. The ether, if anhydrous, and S.G. of 720, may be made from mythelated spirit. Care should be taken in all cases to ascertain its being correct, and of the purest quality.—*Dublin Journal of Medical Science, Nov.* 2, 1872, *p.* 360.

98.—NOTE ON THE ADMINISTRATION OF ETHER.

By John Couper, Esq., Surgeon to the London Hospital, and Assistant-Surgeon to the Royal London Ophthalmic Hospital.

At Moorfields from eight to twelve patients are anæsthetised during the few hours of each day devoted to operations; thus the time consumed by each administration is of some, although secondary, importance. A slow anæsthetic is hardly admissible. Ether has been used there since August in a large number of cases. No difficulty has been found in speedily producing perfect muscular quiscence. The time necessary for complete narcotism is about the same as with chloroform—certainly not longer.

A marked and invariable feature has been the absence of all disposition to syncope. There have been no sudden failures of pulse, with pallid lips, even under the most lavish use of the anæsthetic; on the contrary, complete muscular relaxation was generally associated with a flushed face and full pulse. A folded towel enclosing a piece of sponge has been the only inhaler used. Only when this is soaked with anhydrous ether is a vapour of adequate concentration obtained. The presence of even small percentages of water reduces the volatility of ether very considerably, and prevents a satisfactory result.

Without disparagement to less simple devices for administering a vapour of known strength, it may be asserted that the folded towel possesses great practical convenience, and has yet to be proved dangerous. By no other method can a vapour of adequate concentration be so readily obtained. Not only is there no danger in this lavish use of the anæsthetic, but narcotism is produced more quickly, and with less cerebral excitement, than is apt to result from too weak a dose at the outset. If the latter fault be committed, the patient becomes noisy and violent, and the vessels of his face and head becomes turgid—a condition unfavourable to many operations. On the other hand, by an adequate dose, narcotism, without excitement, is

produced, and can then be easily maintained for an indefinite period by a less concentrated vapour.

The sole objection to this mode of administration is the overpowering sense of impending suffocation, apt to be produced by the first contact of the vapour with the air passages. While my experience accords with that of Dr. Joy Jeffries as to the necessity for a strong dose at the outset, I do not believe with him that a forcible administration in spite of the patient's struggles, is a desirable or necessary practice. By a little management in the case of adults, it may generally be dispensed with. They often take it without struggling, when forewarned that a few deep inhalations resolutely taken dispel the sense of choking. When voluntary efforts fail to overcome spasm of glottis provoked by the vapour, it is best to relieve them by momentarily raising the towel from the face, and allowing one full inspiration of unmixed air before panic takes possession of them. By this manœuvre the spasm instantly disappears, and does not return when a concentrated vapour is again inhaled. It should be remembered that the struggling occurs before the ether has had time to affect the brain, and the cause of it—the irritation of the air passages—disappears at the very commencement of anæsthesia, after one or two full inhalations of vapour. Occasionally, no doubt, an adult is entirely wanting in self-command, and fails to cooperate in the administration. A little force may then be needed, but should not be prolonged more than a few seconds. After a few inhalations of strong vapour, a breath or two of unmixed air should be given, and the inhalation then resumed, probably without resistance from the patient.

Children must be narcotised forcibly, but their struggles are neither so violent nor so distressing to bystanders as those of adults. Ether does not blister even after prolonged contact with the skin, and in this respect is altogether different from chloroform and methylene.—*British Medical Journal*, *Nov.* 30, 1872, *p.* 604.

99.—REPORT OF FIFTY CASES OF ETHER ADMINISTRATION IN THE GENERAL INFIRMARY AT LEEDS.

By A. F. McGill, Esq., Resident Medical Officer.

Ether has been used in the Leeds General Infirmary in all cases in which it has been necessary to produce anæsthesia since November 8th. This report refers to the first fifty cases, and extends over a period of three weeks, from November 8th to November 30th. In the first eleven cases, the ether was given on a small sponge, covered by a folded towel. This

method was found to be inconvenient. In the other cases, a large conical hollow sponge, covered with waterproof jaconette, has been used. The drug employed is the best methylated sulphuric ether: about one ounce is placed in the sponge, which is held tightly over the face, so as to exclude air as much as possible.

Of the fifty cases, nineteen were children under fifteen years of age; thirty-one were adults above that age. The average time required to produce anæsthesia was, in children, one minute and a half; in adults, two and a third minutes. The quantity of ether required was, in children, an ounce and two-thirds; in adults, two ounces and one-third. The average time for which the anæsthesia was kept up was, in children, seven minutes; in adults, twelve minutes; the quantities used being two and a half ounces and four and a half ounces respectively. Vomiting occurred in thirteen cases; in six children, and in seven adults. The following cases exemplify the use of ether.

I. A woman aged 62, had ovariotomy performed by Mr. Wheelhouse. Three minutes after the commencement of administration, three ounces having been used, she was insensible, and the operation was commenced. Perfect anæsthesia was kept up for thirty-three minutes. She never vomited after the operation, and made a speedy recovery.

II. Mr. Jessop performed the operation of lumbar colotomy on a woman aged 25. Three ounces of ether produced complete anæsthesia in three minutes. The operation was one of extreme difficulty, owing to the small size of the colon, and lasted sixty minutes, eleven and a half ounces of ether being used. No vomiting occurred, and the patient recovered without a bad symptom.

III. A woman aged 50 came to the Infirmary with a dislocation of the humerus into the axilla. This could not be reduced, owing to the rigid condition of the muscles. She was placed under the influence of ether, and within two and a half minutes the muscles were relaxed and the dislocation reduced.

Cases like the above show that ether can be used with advantage in severe and long operations, and also when it is necessary to produce muscular relaxation.

The following are the chief ways in which the action of ether differs from that of chloroform.

1. The heart's action is stimulated and the pulse improved, there being no tendency towards that most dangerous of all symptoms, cardiac syncope.

2. The respiration is laboured, and the blood imperfectly aërated, as shown by its becoming dark, as though venous, in the arteries.

3. Vomiting is less frequent, and not so troublesome: in only one case out of the thirteen in which it occurred was it at all persistent.

4. Struggling during administration is of frequent occurrence.

5. Restlessness and noisiness after the operation, lasting for some hours, is not unfrequent.

6. Patients who have had both ether and chloroform, much prefer the latter.

In conclusion, I may add that the advantages and disadvantages of ether and chloroform seem to be so nearly balanced, that the question as to which should be used appears to be one of safety only. If further experience prove that ether is the safer, then it should be adopted; but if this be not proved, then I should prefer chloroform, as being both cheaper and easier to administer.—*Brit. Med. Journ.*, *Jan.* 4, 1873, *p.* 9.

100.—REPORT ON THE ADMINISTRATION OF ETHER AS AN ANÆSTHETIC IN HOSPITALS.

Middlesex Hospital.—Mr. G. Everitt Norton, chloroformist to the hospital, writes:—For the past three months, ether has been generally administered at this hospital with satisfactory results. The longest time during which its inhalation has been continued was an hour, in a case of colotomy. The patient did not experience any inconvenience from the anæsthetic, and had no sickness. It is administered at this hospital mixed with air, passed over a vapour of ether at a temperature of about 70 deg. Patients finds its inhalation by this method far more pleasant than by the ordinary methods. There appears to be by this plan less struggling, and the patients rapidly become insensible. The average time required for an adult is from three to four minutes, and for a child from one to two minutes. I administered ether in a case of ovariotomy last week. The patient was fully under its influence in three minutes and a half; the operation lasted thirty-five minutes, and, during that time, she only required two ounces and a half. Her pulse became very weak during the operation, and at times almost imperceptible. She was slightly sick about half an hour after the operation, and once again seventeen hours afterwards. She is doing well. The sickness after ether is not more frequent than after chloroform; and, when it does occur, it does not continue so long, but is more severe while it does last. Ether also sometimes causes great excitement a few hours after the operation, which, of course, in some cases—as delicate eye-operations—is a thing to be avoided. A little boy was operated upon at mid-day for hip-joint disease, ether being

administered. In the evening, he became so excited, that it was with difficulty he was kept lying down in bed. The rigidity with ether is not more marked than with chloroform, and is soon overcome by pushing the ether anæsthesia. The pulse varies a great deal during the administration of ether; in some cases it has been noticed as high as 140 in a minute, in others as low as 40. In some cases, during the inhalation of ether, there is an excessive secretion of saliva. Patients who have inhaled both chloroform and ether give the preference to chloroform as being far more agreeable. Consciousness does not return more quickly after ether than after chloroform. In conclusion, ether does not appear to have any advantages over chloroform, unless it be proved to be safer. Patients often complain of the taste of the ether on the day following the operation, and generally smell strongly of it. I have now fixed to the expiratory valve of the inhaler which I use a long India-rubber tube, which conveys the expired ether to the floor. This prevents the operator and assistants from being annoyed by the vapour.

London Hospital.—Mr. Lewis Mackenzie, house-surgeon, writes:—Our four surgeons almost universally use ether now: Mr. Hutchinson makes the exception in the case of old people, for whom he prefers chloroform. Each house-surgeon has an "anæsthetic record"—that is, a book in which he enters the particulars of every case in which anæsthesia is produced, &c. Ether has been administered sixty or eighty times at this hospital with perfect success. The violence of the "excitement stages" has in certain cases been rather deleterious—as, for instance, to-day, in a case of compound comminuted fracture of the lower jaw, the muscular spasm and talking, during the recovery from anæsthesia after administration of ether, completely shifted all the apparatus, allowing the fragments to get out of position. In such a case, Mr. Hutchinson remarked, chloroform would be judiciously used to keep up a state of anæsthesia originally produced by ether. I have as yet seen no particularly good inhaler for ether. We generally use a towel, in form of a cone, with a sponge. I am not in a position to say anything definite about the circulation, respiration, vomiting, &c., at present.

University College Hospital.—Mr. Walter Rigden, resident medical officer, writes as follows:—I have as yet only administered ether twelve times, and consequently have not yet been able to form an opinion of much value. The plan of administration has been that recommended by Dr. Joy Jeffries—*i.e.*, a towel folded into a cone and a piece of lint about eight inches square screwed up and put into the inside. I then pour on to the lint as much ether as I can get it to absorb without soaking

through to the towel—generally about an ounce and a half—and tell the patient to breathe deeply. In about four or five minutes he has generally been sufficiently under for slight operations, such as opening abscesses, or examining sinuses; in from seven to ten minutes he has generally been thoroughly under for any operation. Patients have inhaled it well; there has been no more struggling than usually occurs with chloroform; it generally sets up more or less bronchial irritation and flow of saliva, and this may last a quarter of an hour after the operation, but this is not usual. The patients have not complained of more unpleasant sensations either during the administration or afterwards than are often noticed with chloroform inhalation. In three cases out of the twelve there was vomiting afterwards, and in these it was not protracted; one of the other patients felt nausea for an hour or two afterwards, but did not vomit, and two suffered from severe headache for twenty-four hours after the operation. I have used three or four ounces of ether for operations of fifteen or twenty minutes' duration; and in one operation for lacerated perinæum, which lasted seven minutes under an hour, I kept the patient well under with seven-and-a half ounces. I have not noticed the ether to escape into the surrounding air to any disagreeable extent. From my limited experience, I think that ether auswers very well: the chief objection seems to be, that one has to use much more of it than one would of chloroform.—*British Medical Journal, Jan.* 11, 1873, *p.* 35.

101.—STAGES OF ANÆSTHESIA.

By Dr. KIDD, Dublin.

Practical surgeons are familiar with three, if not four "stages" in the process or progress of rendering patients insensible to pain for surgical operations. Two stages of excitement, probably cerebral and spinal; two stages cerebral and ganglionic, evidently depressant. Thus, an otherwise quiet man will suddenly burst with the strength of six men out of bed in the earlier excitement stage; a vigorously acting uterus will as suddenly lose all action in the later or third stage. These stages, no doubt, follow one another insensibly and quickly where the anæsthetic is continued in the ordinary doses. One sees them under all anæsthetics and under every variety of inhaler.

Three essential stages—and as to their progression quickly or slowly, will the anæsthetist measure the quantity of the ether or chloroform necessary. Some subjects are struck down almost at once, others, as hysteric women, resisting it. Three

stages—one of excitation, the heart oscillating, as it were, in a balance uncertain; a puzzle to outsiders, but to the man of skill only following the changes of the respiration regularised by it, especially as through the second into the third stage the circulation becomes slow, and pulse may even disappear, and is slow too as a consequence; but there is no fear if the man is not trusting to mechanic stop watches or inhalers.

It is well to remember that no two patients inhale chloroform or ether, or nitrous-oxide gas alike; each case is a half-physiological, half-practical little problem by itself, where the true expert is watching these varying changes of respiration, face expression—natural progression of the stages. This healthy oscillating of the heart and lungs, with an eye-out for sickness and vomiting; nor will he neglect these, trusting to something mechanical, like the bow of Ulysses in the classics, so like the chloroform balloons, double valves, bellows, &c., that no one else can bend or make use of except the instrument-maker himself.

102.—ON THE CHOICE OF ANÆSTHETICS.

By Jonathan Hutchinson, Esq., Senior Surgeon to the London Hospital; Surgeon to the Moorfields Ophthalmic Hospital, and to the Hospital for Skin Diseases.

[Mr. Hutchinson commences this paper by relating a case he had had in private practice, in which death from hemorrhagic apoplexy occurred ten hours after an operation for the removal of a cancerous sub-maxillary gland. The patient was 84 years of age, and never spoke coherently after the operation. After commenting on this case, the author continues:]

In reference to the general question as to the choice of anæsthetics, I may say that I am strongly of opinion that we ought, with the exception of a few cases, to allow ether to supersede chloroform. I have now employed ether in so many cases, both at this hospital, at Moorfields, and in private practice, that I am justified in forming an opinion as to its general applicability. It appears to me that you can do anything with it that you can do with chloroform. It is not quite so rapid in its action, and, on the whole, not quite so convenient to use. Patients complain also more of its disagreeable consequences in the way of headache, &c., but these are matters really of comparatively little importance in the majority of operation cases. Now and then it happens that a patient after ether struggles and becomes violent in the stage preceding the full return of consciousness, and in fear of this result I have never yet given

it for extraction of cataract; nor do I ever intend to do so, for, as our patients in these operations are always elderly, they are those who bear chloroform well and ether ill. I do not think that at Moorfields we have ever lost by chloroform a patient in whom it was given for the extraction of cataract. Those who have died, and there have been several (none under my own care), have almost always been young patients, and generally, I think, for strabismus operations. Then, again, for young infants, in whom chloroform seems to be exceptionally safe, I think I shall still continue to prefer it. For such operations as hare-lip, for instance, chloroform is more convenient.

At Moorfields we have for long been in the habit of using methylene. It is certainly more rapid in its action than chloroform, but I have never been sufficiently impressed, either with its superior convenience or its additional safety, to be induced to employ it either in private practice or here. I have seen several cases in which alarming symptoms occurred during its use, but never an actual death.

Our one reason for abandoning chloroform is its danger. If we could get rid of this, it would certainly stand without rival. My own experience of chloroform has been very considerable, and for a great variety of cases. I have had but a single death in my own practice, but I have been the witness of several in the practice of others. I have also had amongst my own patients several very alarming occurrences, in which it was with the greatest difficulty that death was prevented. In the case of a girl at Reigate, in whom apparent death occurred during excision of the knee, we had to perform artificial respiration for at least ten minutes before any signs of reanimation occurred. In another case at the London Hospital, in an amputation of the thigh, the period during which I thought the patient dead was almost as long. In both these instances, death-like pallor of face and absence of pulse (cardiac syncope) were the alarming symptoms; and in both artificial respiration, irritation of the surface, and the use of brandy enemata, were the means resorted to. In addition to them, I have had many cases in which the pulse failed temporarily, and in which we had to begin artificial respiration in order to ward off the more dangerous condition. During the last four or five years, I think I have had fewer alarming cases of this kind than formerly; and I attribute this in part to the skill and care of those who have given chloroform for me, and in part to the fact that I have been very particular as to the administration of stimulants (brandy) before using the anæsthetic. I have never of late used chloroform without knowing that my patient had fasted for some hours, and had taken a dose of brandy within

the last half-hour. These seem to me the two principal points; but, if you insist upon the one (the fasting), it is additionally important that you attend to the other. In a fasting and exhausted state of the system, we have the condition in which cardiac syncope is the most likely to occur.

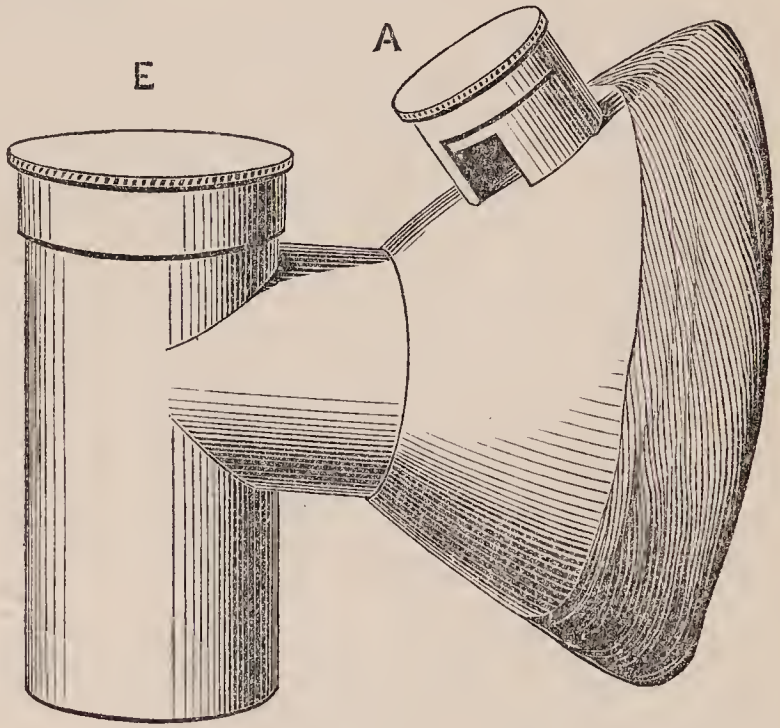
The case which I have alluded to as the only one in which I have had death actually occur, was that of a man much exhausted by a month's suppuration from a compound fracture with his elbow-joint. I saw that he was very nervous when he was put on the operating table, and I ought to have given him brandy before proceeding. His heart failed within five minutes of the commencement of the inhalation, and before I had begun the operation. If your patient is unusually feeble, I do not think it well to do an operation early in the morning—*i.e.*, before the first meal. Indeed, in all cases in which an early appointment is made, it is best to tell the patient to take some fluid food, coffee, beef-tea, or milk, about two hours before the time fixed. Under most other circumstances I should insist upon a four hours' fast, with the double object of preventing the danger which attends vomiting during the anæsthesia, and the inconvenience and suffering which it sometimes produces afterwards. As regards the quantity of brandy to be given, that should be in proportion to the patient's age and habits, bearing in mind that it is better to give too much than too little. It is given in order to act as what is called "a diffusible stimulant;" which, I suppose, means that it is to keep the blood vessels well open, and thus facilitate and sustain the circulation. Ether is an agent of a similar class, and hence its freedom from risk as compared with chloroform. Opium also acts in the same way, and I have no doubt that the administration of a good dose of opium, or the inhalation of ether for a few minutes before using chloroform would, either of them, make the latter much more safe.

There is just one other little matter to which I wish to advert. You may have observed that in cases in which the anæsthetic is used in order that the actual cautery may be applied to some part of the face, as we not unfrequently do for lupus and rodent carcinoma, I always give chloroform. Sometimes we give ether for a few minutes first, but we always take care that the vapour has had time to pass away before the cautery is brought near to the face. The reason for this is obvious; the vapour of ether is very inflammable, and a little thoughtlessness might easily lead to a terrible accident. It may be well also, for the same reason, to avoid employing ether by candle light.—*British Medical Journal, March* 8, 1873, *p.* 247.

103.—DESCRIPTION AND ILLUSTRATION OF AN ETHER INHALER, WITH OBSERVATIONS UPON A MIXTURE OF CHLOROFORM AND SPIRIT OF WINE FOR PRODUCING ANÆSTHESIA.

By B. Wills Richardson, Esq., Surgeon to the Adelaide Hospital, Dublin.

The relative safety of chloroform and ether as anæsthetics having been recently brought before the profession in Dublin by my friend, Mr. John Morgan, at the first meeting of the Surgical Society of Ireland for the present Session, it appeared to me that it would be advisable to have constructed a simple and moderate-priced inhaler for etherization in hospital practice. This inhaler (see Fig.) has been designed as a substitute for the towel and sponge, in the use of which there is much waste of ether, a matter, in hospital economy, that may be of some importance.



A.—Air opening. The amount of air to be admitted to the face-piece is regulated by a sliding cap, having an opening of the same size as that in the tube on which it turns. At the beginning of the inhalation, the inner opening may be fully exposed and gradually covered, by rotating the cap according as the air passages of the patient become accustomed to the vapour. E.—Ether box, to hold a little more than an ounce and a half of ether. This box communicates with the face-piece by means of a tube an inch in length and one inch and a half in diameter, the ether box opening of the tube being two-thirds closed by a fixed diaphragm. This prevents the fluid ether from passing into the tube when the patient is in the horizontal position. The face-piece opening of the tube has a diameter of one inch. The tube itself, in order to increase the evaporating surface, should be nearly filled with soft cotton candlewick, having, when in use, one end submerged in the fluid ether. The inhaler may be made of silvered copper or block tin; but the face-piece margin should be formed of flexible metal, and covered with morocco leather.

Although I have not myself adopted ether to the exclusion of chloroform, having had most satisfactory anæsthetic results from the use of a mixture of chloroform and spirit of wine, still I think it is our bounden duty, the relative danger of chloroform over ether having been so prominently raised, to test the point, that we may aid in the attempt to solve this deeply important question.

It is almost needless to write, that a question requiring such accurate and unprejudiced observation for its solution as that of the relative anæsthetic safety of chloroform and ether cannot be settled in a day.

To satisfy the logical mind it would be necessary to administer the two agents to an equally large number of persons. and to the same class of persons, having either injuries or diseases similar in their nature. As this, however, would be impossible, we can only arrive at an approximate estimate of the relative safety of these anæsthetics.

Whether or not ether is destined to recover its long-lost prestige in the United Kingdom remains, therefore, to be proved. At all events, Mr. Morgan deserves credit for the talent and energy he has applied to the solution of this important, and if I might venture to call it such, biological question.

According to Snow, about a fluid ounce of ether is usually inhaled by an adult patient in becoming insensible; but in order that the administrator may not, if possible, have to refill the box, it is made of a size sufficient that an ounce and a half of ether when in the box will fill it to near the upper margin of the diaphragm. It is necessary, according to Snow, that the inhalation should commence, as in the case of chloroform, with the expiratory valve of the face-piece of his inhaler turned to one side, that the vapour should be admitted to the air passages by degrees, to avoid the irritation that would arise from suddenly inspiring any considerable quantity of the vapour. In this inhaler the admission of air is regulated by the sliding or rotating cap A. When the inhalation has been in progress for one to two minutes, the patient should be made to breathe nearly altogether the pure vapour, which is effected by rotation of the cap A. If there be no peculiar susceptibility against ether narcosis, the latter will be complete in a few minutes.

The quantity of ether my friend Mr. Morgan pours into his ingeniously-constructed inhaler is from one and a half to two ounces. For the description of this excellent apparatus, and for much interesting matter on ether as an anæsthetic, I must refer the reader to his very instructive monograph on the subject.

Although deaths, it must be conceded, have resulted from the inhalation of ether, I will, notwithstanding, reproduce here the

following observations of Snow regarding the safety of ether, as an inducement for the trial of ether by those who are not disposed to do so in consequence of their having had good luck in the use of chloroform.

"I believe," he has recorded, "that ether is altogether incapable of causing the sudden death, by paralysis of the heart, which has caused the accidents which have happened during the administration of chloroform. I have not been able to kill an animal in that manner with ether, even when I have made it boil, and administered it quite pure." . . . . "I hold it, therefore, to be almost impossible that a death from this agent can occur in the hands of a medical man who is applying it with ordinary intelligence and attention."

When we compare these observations with the information collected by Mr. Morgan regarding the safe anæsthetic properties of ether, we feel constrained to observe that he would be prejudiced indeed who neglected to test the relative anæsthetic safety of chloroform and this agent.

I confess that I am myself in favour of a mixture of equal parts of chloroform and spirit of wine for producing anæsthesia, and, therefore, it is the comparative safety of this fluid I purpose testing against the ether. This mixture is best administered with either a piece of lint, a handkerchief, or with Skinner's apparatus, for the following reasons mentioned by Snow:—"Whenever chloroform is administered from a handkerchief or sponge, it should be diluted with one or two parts, by measure, of spirit of wine or eau-de-Cologne. In this way, the convenience of the handkerchief or sponge can be taken advantage of without the danger. Very little of the spirit is inhaled, as the greater part remains behind after the chloroform has evaporated; but it acts by lowering the elastic force of the vapour of chloroform, and diminishing the amount of vapour which is given off from the handkerchief or sponge, just as diluting a strong solution of ammonia with additional water diminishes the amount of the volatile alkali, which escapes as gas. One hundred cubic inches of air are capable of taking up fourteen cubic inches of vapour, at 60°, from pure chloroform, and becoming expanded to 114 cubic inches; but when the chloroform is diluted with an equal volume of alcohol, it will only yield eight cubic inches of vapour to 100 of air. In passing over a sponge or handkerchief, the air would take up less than this, usually four or five per cent., which is a quantity sufficient to cause insensibility in four or five minutes, without the risk of sudden accident."

I do not recollect that I have seen this mixture produce insensibility in so short a time as Snow mentions.

In conclusion, may I observe, that in the present medico-

legal aspect of the relative safety of ether over chloroform for the production of anæsthesia, it would not, perhaps, be injudicious upon the part of the administrator to permit the patient to select the anæsthetic.—*Dublin Journal of Medical Science, March* 1873, *p.* 227.

104.—NOURSE'S ETHER INHALER.

Mr. Nourse of Brighton has forwarded a cheap and very simple inhaler for ether and chloroform. It consists of a cone of cardboard two or three inches in depth, made so as to cover the mouth and nose with comfort. A flat sponge is inserted into and covers the upper end of the cone. This is kept in its place by a few cross stitches with thread.

As an ether inhaler it presents the advantages of cleanliness, simplicity, and cheapness. The sponge, however, does not effectually close the upper end, and accordingly the ether evaporates rather freely from its upper surface, and is also dispersed by the violence of expiration, thereby causing waste of the anæsthetic and inconvenience to the administrator, and inordinately filling the room with ether.

As a chloroform inhaler it would be highly dangerous.—*British Medical Journal, Feb.* 22, 1873, *p.* 200.

105.—ETHER *versus* CHLOROFORM.

By J. T. Clover, Esq.

In discussing the merits of ether and chloroform as anæsthetics, there are two questions which ought to be considered separately. 1. Which is the less likely to cause death? 2. Which leaves the patient in the more favourable condition afterwards?

As to the safety of chloroform, my experience of it during the last twelve years, since I adopted the plan of measuring the chloroform and air, so as to insure that there shall not be more than three minims and a half in each hundred inches of air, has been so favourable that I have never felt the need of another anæsthetic on the ground of safety. I have administered it without rejecting a single case as unfit for it, and to many persons whose heart and lungs were in a morbid state. I have never had a death from it or any other anæsthetic.

I have experimented with stronger doses, and found that the tendency to produce cardiac syncope increased with the dose. This tendency of chloroform to depress the action of the heart

has not been sufficiently recognised; and many surgeons, regarding failure of respiration as the danger to be chiefly watched for, do not habitually keep the pulse under observation.

A stronger dose than I have mentioned may be inhaled safely whilst respiration is carried on regularly; but when, as often happens, the pungency of the vapour induces the patient to hold his breath and then breathe very freely, a state of rigidity sets in. This condition, when the patient after a full inspiration holds his breath and strains, is one of the greatest interest. In any case, the first effect is to make chloroform enter the blood more freely, for blood will take up more chloroform in proportion to the atmospheric pressure, just as water does the carbonic acid in the making of soda-water. If the proportion of chloroform in the air-cells be small, it soon becomes so reduced by absorption into the blood, that after twenty or twenty-five seconds, the blood passing through the lungs gets so little that the patient may be less narcotised than when the rigidity commenced. When, however, the quantity of chloroform is above four per cent., the heart soon begins to fail, and as the blood now circulates more slowly through the lungs, another condition favourable to the absorption of chloroform is induced. If chloroform be administered without due means to prevent a large dose from being given, and without watching the pulse, I have no doubt that it is more dangerous than ether.

As to the question, whether ether or chloroform leaves the patient in the better condition, I should say that a patient kept quiet during an operation for half an hour would recover better from chloroform than from ether. The point may be considered as doubtful, and perhaps the after-effects of ether would be less unpleasant if we could contrive a better way of administering it. As it is usually given, the patient gets very little fresh air, and carbonic acid does not escape so freely as it ought. I have lately been giving ether by a modification of my chloroform apparatus, which supplies the patient with air charged with ether. It consists of an oval piece of glass as large as the face, and set in a frame which keeps it a little distance from it. The sides are closed in with a curtain all round, and into this chamber air and ether are supplied in a slow current. I find that this produces less coughing and less opposition than other ways of giving it. The patient's face can be seen. The eye can be examined by pushing the curtain in front of the finger end raising the eyelid. As I hope to write shortly a further description of this apparatus, I will not further occupy space now.—*British Medical Journal, Nov.* 9, 1872, *p.* 534.

106.—ON ANÆSTHETICS.

By Dr. Thomas Jones, Assistant-Physician to Victoria Hospital for Sick Children, formerly Resident Medical Officer and Administrator of Anæsthetics to St. George's Hospital.

In a paper read on this subject before St. George's Hospital Medical Society in 1863, I observed that the result of my experience to that time tended to show (1) that ether caused during the first stage more cerebral excitement than chloroform; (2) that it produced a greater degree of anæsthesia before the consciousness was completely abolished; (3) that during the stage of very complete unconciousness, the reflex function of the cerebro-spinal centres was not abolished to the same degree as under chloroform; (4) that it stimulates instead of depressing the heart.

My subsequent experience confirms, in the main, these conclusions. Ether, unlike chloroform would seem to exert no paralysing influence on the heart, carried to the extent necessary for the performance of operations. In the paper referred to, I related two cases in which ether was administered with good effect after chloroform had been tried and found to produce dangerous symptoms.

Dr. Snow states (On Anæsthetics, p. 362) that "ether is altogether incapable of causing sudden death by paralysis of the heart, which has caused the accidents which have happened during the administration of chloroform. I have not been able to kill an animal in that manner with ether even when I have made it boil, and administered the vapour almost pure. The heart has continued to beat after the natural breathing has ceased, even when the vapour has been exhibited without air. . . . I hold it, therefore, to be almost impossible that a death from this agent can occur in the hands of a medical man who is applying it with ordinary intelligence and attention." When this passage is taken in connection with the fact that Dr. Snow records in the same work no fewer than fifty fatal cases from chloroform, it is very wonderful that he should still persevere in the use of chloroform, especially when we find he observes (*op. cit.*) that he "usually rendered adult patients insensible in four or five minutes, and children in two or three," and that he "never failed to make the patient insensible in any one instance in which ether was administered." Hence, ether being in his hands perfectly successful and manageable, I cannot help agreeing with the opinion advanced in the leading article in this Journal of the 16th instant, that he, like every one else, was considerably influenced in the choice of the anæsthetic which he used by the energetic and uncompromising advocacy of the discoverer of chloroform.

I think the disadvantages of ether over chloroform are really very few and trivial. I find that some prefer the flavour of ether vapour to that of chloroform. Its pungency, when inhaled, only lasts a few seconds, and not at all in some cases, when properly administered. As to the question of cost, I also think this objection has been exaggerated. Methylated washed ether (which answers all purposes quite as well) can be bought for half-a-crown a pound. If the anæsthetic be given rapidly and unsparingly at the commencement, I do not think the dose for each patient should cost more than sixpence—so that, in fact, the cost is not much greater than that of chloroform.

With reference to the mode of administration, I think the plan recommended by our American friends is as good as any—namely, a thick towel, in half-dozen folds, arranged in the form of a cone. Care should be taken that its base should be large enough to take in the chin and the nose—its shape such as to fit the face accurately. A small sponge should be placed inside, which should be squeezed out of warm water after each case to prevent its becoming so cold as to interfere with the evaporation of the ether. Mr. Warrington Haward's apparatus, described in this Journal on the 2nd inst., is also a convenient method of administering it, and answers very well. But I find that the oiled silk, which forms its external layer, is an objection, because it interferes with the conduction of heat from the hand into the interior of the cone. In a cone covered with the oiled silk, the interior becomes so reduced in temperature that the evaporation of the ether is considerably checked.

Thinking that an inhaler would effect, amongst other advantages, considerable saving of the ether, I have had for some time my attention directed to this point, but have not as yet succeeded in suggesting any improvement upon the one adopted by Dr. Snow.

The Combination of Chloroform and Ether.—My experience, in the main, confirms the opinion held by Dr. Snow, that the combination of these two liquids combines the undesirable qualities of both. When the two agents are combined in their liquid state, one never knows what one is about. I should not have considered it necessary to allude to this point, had I not seen a communication from Dr. Edis in the Journal of November 16th, still advocating this method—one which, I thought, had been given up some time since. I have, however, been in the habit for some years past of administering the vapours of these two agents to the same patient with considerable advantage. I begin with chloroform; but as soon as the pulse shows signs of failure, I commence the administration of ether, and continue its use until the pulse is restored, or as long as

the patient remains quiet enough for the performance of the operation. In this manner, I believe, the cases of avoidable deaths from cardiac failure resulting from chloroform might be averted.

Nitrous Oxide.—When I consider the safety, ready applicability, and the pleasantness of this agent, together with the success attending it, I confess I am surprised that surgeons do not adopt it more generally than they do for the minor operations requiring but few minutes in their performance. I have succeeded in keeping the patients under its influence for eight or ten minutes by its reapplication from time to time. I think that for some cases of operations about the eye its use would be invaluable, seeing that it produces no sickness.—*British Medical Journal, Nov.* 30, 1872, *p*, 603.

107.—ON THE TREATMENT OF CHLOROFORM POISONING.

By Dr. G. Vivian Poore, Lecturer on Medical Jurisprudence at Charing-Cross Hospital.

[If the case seems one of a really serious nature,]

At once commence artificial respiration after Silvester's method. Get an assistant to hold the tongue well forward, and begin the artificial respiration with expiration, your first object being to empty the lungs of the chloroform vapour. Let your patient lie flat upon his back, and take up your position directly behind him. Then seize the patient's arms just at the elbows, press them firmly against the sides of the thorax, and then slowly and gradually and firmly draw them directly above the patient's head. Each time that this is done properly the noise of inspiration will be heard. Above all things, do not hurry, and do not perform the act of artificial respiration too quickly, or you may thereby defeat your object. About fifteen times in a minute is quite enough. When speaking of the importance of not hurrying, Dr. Marshall Hall says: "I removed larynx and windpipe, and attached the nozzle of the syringe to the lower part of the latter; on drawing up the piston the chordæ vocales were seen to be drawn together whenever the piston was moved with some degree of rapidity, *and all ingress of air into the windpipe utterly prevented.*" The conclusion which we must draw from this experiment is, that if you attempt to make air pass with undue rapidity through the trachea you defeat your object.

Having got artificial respiration fairly started, send the nurse for a hot bottle, and one of the assistants for Stöhrer's galvanic battery, and if there should be any more bystanders

bid them promote circulation by friction of the legs. When the hot bottle arrives place it between his legs, being careful not to scald him, but do not for a moment relax your efforts at artificial respiration. On the arrival of Stöhrer's battery proceed to galvanise the phrenic nerve, and so help inspiration by causing the diaphragm to descend. Place one rheophore just at the point where the omo-hyoid muscle passes beneath the sterno-mastoid at the anterior part of the posterior triangle of the neck. Have your rheophore well moistened, and press it firmly down in this situation, then apply the other rheophore to the lateral region of the thorax in the sixth or seventh interspace. This will cause a steady descent of the diaphragm. After five or six seconds break contact again. Then, after a slight interval, make contact, and so on. Each contact of the rheophore will cause descent of the diaphragm and consequent inspiration. There are two things to be guarded against; one is not to use too strong a current, and the other is not to continue the application for too long a time. You must cause the diaphragm to descend so as to imitate natural respiration as closely as possible. Remember it is the phrenic nerve and the diaphragm that you want to galvanise. If you attempt to galvanise the pneumogastric nerve and the heart, you will only be adding another cause of death to the one with which you are already grappling; and, for the purpose of avoiding this, I advise that the rheophore should be applied to the lateral, and not the sternal, region of the thorax. I see no reason why galvanism of the diaphragm and Silvester's method should not be employed simultaneously. In this case you would apply the rheophore to the diaphragm at the time at which the arms are drawn above the head, and you would break contact while the elbows are being pressed against the side. If these methods succeed (as they invariably do succeed) in causing inspiration and expiration, you must continue perseveringly to use them. Admit lots of fresh air, at the same time keeping your patient warm with a blanket and a hot bottle, and endeavouring to promote circulation by friction of the limbs. These efforts must not be relaxed for at least an hour and a half, for we have the evidence of successful cases to show that up to this time there is hope of recovery. In resuscitation from an overdose of chloroform, as well as in resuscitation from drowning, the attendants should bear in mind the admirable motto chosen by the Royal Humane Society, *Lateat scintillula forsan.*

Artificial respiration is undoubtedly the measure *par excellence* on which we should rely. If the above modes of inducing it do not succeed, a catheter may be passed into the larynx, and inflation of the lungs effected through it. Brandy enemata, flipping with a towel, and the application of ammonia

to the nose, are not likely to be of much use if artificial respiration does not answer, but they may all be of some service if the patient only partially rouses, and shows signs of relapsing again.

In those cases which die suddenly, apparently from paralysis of the heart, Dr. Holms, of Chicago, recommends that the patient should be placed with his head downwards, on an inclined plane of about forty degrees.

Patients who are going to take chloroform should be warned not to take any solid food for some hours previously, so as to lessen the chance of vomiting. On the other hand, we must be careful that the patient is not exhausted from want of food at the time of the operation. If a patient is to undergo an operation at 2 p.m., I usually direct him to eat a good substantial breakfast at 8 a.m., and then about 12 o'clock to take a small basin of soup and a glass of sherry. You must not allow him to take solid food for at least four hours before the operation, for the process of digestion seems to be delayed by the state of mental anxiety in which a person usually is before a surgical operation, and I have often been astonished at the great lumps of undigested meat which I have seen a patient vomit, although his last meal had been some hours before.

I have seen two nearly fatal cases of syncope under chloroform, due, I believe, to the exhausted condition of the patient. One was that of a little girl in delicate health, who, prior to being operated upon for squint, had been kept, in the middle of winter, for three hours in a cold waiting-room, she not having had any food since breakfast, the time then being 3.30 p.m. The other was that of a woman who was to have ovariotomy performed, and whose last meal, a very small one, had been five hours previous.

For the first ten or twelve hours after taking chloroform I think it is advisable to limit the patient to a liquid diet, so as to avoid all risk of inducing vomiting. It is a good plan, especially if the patient has been subjected to a severe operation, to give a dose of morphia, hypodermically or otherwise, before the effects of the chloroform have quite passed off. This will induce sleep for four or five hours, and the patient will awaken therefrom much refreshed.

Are there any conditions which contra-indicate the administration of chloroform? No. I believe that chloroform may be safely administered in all cases in which it is thought advisable to subject the patient to surgical interference. If he have a fatty heart I believe that his very safety (supposing an operation to be absolutely necessary) is immensely enhanced by the administration of chloroform, as without it the shock of the operation, acting upon a fatty heart, would very likely

cause fatal syncope. Do not misunderstand me. I do not mean to say that the presence of a fatty heart does not increase the danger of chloroform, for I most decidedly think that it does do so, but I believe that if a patient with a fatty heart (a condition, by-the-by, very difficult to diagnose) is absolutely obliged to undergo a serious operation, it will be safer for him to take chloroform than not to do so. Moderate valvular disease of the heart or disease of the lungs does not increase the danger of chloroform. An intermittent pulse is no contra-indication. Hysteria is a condition that causes inconvenience, but no danger. If a patient has an hysterical fit, as is not uncommon in the early stages of chloroform inhalation, continue the administration, and you will find the hysterical condition gradually subside. With epileptics the rule is different. The epileptic convulsion is an asphyxiating condition; if therefore a convulsion occur during chloroform-inhalation, stop till the fit has subsided, and then recommence.

Chloroform may be administered to patients of any age. Children, and even babies of a week old, take it very well, but of course great care is required in the administration.

In conclusion, I have only one piece of advice to offer, and that is that when administering chloroform you must give your patient your undivided attention, and you must not allow your thoughts to wander for an instant. You cannot give chloroform and attend to the operation as well. By doing so you jeopardise your patient's life. While under the influence of so powerful an agent as chloroform, the patient's condition varies almost momentarily, and requires almost momentary variations in the mode of administration of the anæsthetic. I believe that many of the victims of chloroform might have been still alive if the administrator had not attempted to do that which, in my opinion, nobody, except in extraordinary circumstances, is justified in doing—namely, the performing of the double office of surgeon and anæsthetist.—*Lancet*, *Dec.* 14, 1872, *p.* 847.

108.—CHLOROFORM IN "SHOCK."

By Dr. Kidd, Dublin.

If patients are suffering from "shock," the pulse improves. Some persons object to the word "shock," but there is none so expressive.

Surgeons differ a little, and the anæsthetist's opinion is expected as to whether chloroform should be given in "shock" or not; a wise precaution is to let the paleness, coldness of skin, oppressed breathing, nauseau, &c., wear off a little first,

after, some warm drink, with ammonia or brandy. The law of tolerance is very remarkable; much will depend how or whether the "shock" is from hemorrhage alone, or from nervous exhaustion, with fright and shattering of limbs; crush or burn of internal parts; or, syncope from reflex injury through inhibitory nerves. On battle fields in India, America, the Crimea, &c., chloroform has acted well in extreme "shock."

One notices the effect of "shock," too, in large hospitals, especially in the manufacturing districts, from crush of machinery. The patient, in all instances, about to be operated on, no matter the exhilaration of nurses, war correspondents, dressers in the operating theatre, is always nervous, *more or less alarmed, and subdued in manner:* beginning to inhale, he often resists, says it is "choking him," or, he "never can stand it." Then it is well to wait fifteen or twenty seconds, or give the inhaler or lint a small dash of eau-de-Cologne to soften the feel of the chloroform.—*Irish Hospital Gazette, April* 24, 1873.

109.—CASE OF FATAL SUFFOCATION FROM NITROUS OXIDE GAS.

By the Editor of the Lancet.

A death from the inhalation of nitrous oxide gas occurred at Exeter on the afternoon of January 22nd of this year. The gas was administered by Mr. J. T. Browne Mason, a dentist in Exeter, for the purpose of securing the painless extraction of a large upper molar tooth from a patient under the care of Dr. Pattinson. As this is the first instance of a death from the gas that has been reported upon in this country, the facts are worthy of special record.

[The patient, Miss Wyndham, was a lady about thirty-eight years of age. She was in good health. Dr. Pattinson was present at the time. The gas was supplied from one of the ordinary iron jars into which it had been compressed. Gas from the same source had been administered to other patients without accident, so that its quality could not be impugned.]

At the beginning of the administration Miss Wyndam's pulse became rapid, and Dr. Pattinson thought less full, whereupon, the patient being quite sensible, the inhaler was taken away, and Mr. Mason made an attempt to extract the tooth; but she said she could not bear it, and begged to have the gas again. After a little delay, to enable Miss Wyndham to wash her mouth, the inhaler was reapplied. She took the gas in the usual way, without any symptoms to excite uneasiness. At the proper degree of insensibility the inhalation was

stopped, and the tooth was extracted. In the operation, Mr. Mason was obliged to split the fangs and take them out separately. It was not until after the operation was completed that anything unusual happened, but immediately afterwards the face became livid, and the "features," it is said, "commenced to swell." Mr. Mason hastened to fetch Dr. Drake, who returned with him, and who found the lady still alive. She was sitting in a chair, in a half-reclined position, before an open window. Dr. Pattinson was by her side endeavouring to restore animation. Her features were livid and swollen, and she appeared to be quite unconscious. She breathed two or three times, and in a few moments after her pulse ceased to beat. All attempts to restore her were useless. Mr. Mason estimated that a volume of six gallons of gas had passed through her lungs.

These are the simple facts of this unfortunate case. They teach a serious lesson, as important as painful. Ruthlessly they destroy the infatuation that the administration of nitrous oxide gas is a harmless process—a process which any man, educated or uneducated, may carry out without danger of destroying life. This lesson must not be forgotten. From no agent have there been so many hairbreadth escapes from death as from this gas; and probably of late some persons every day have been brought within the minutest line of the danger to which Miss Wyndham succumbed. Indeed, a leading dentist told us but a few weeks since that he never operated until the breathing had temporarily ceased. But because through all this risk there has been, it is assumed, no fatal accidents, the administration has gone on in contempt of warning and of obvious danger.

The facts teach another lesson bearing on the cause of death. They show clearly that the assertion, so constantly made, that nitrous oxide gas does not affect the heart, is without foundation, for the first symptom presented by Miss Wyndham under the influence of the gas was rapidity of the pulse, with diminution of volume. But the immediate cause of death was clearly paralysis of respiration. There was no obstruction of the air passages, and the tongue was protruded from the mouth while she still respired; but, as Dr. Drake observed at the inquest, she was as powerless to breathe as though she had been immersed in water.

The most important lesson of all afforded by this painful case is, that we have yet a great deal to learn before we have perfected anæsthesia. Towards such learning the reintroduction of nitrous oxide has been a serious check. Nitrous oxide, indeed, is not an anæsthetic at all. A true anæsthetic is an agent which suspends common sensibility without, by any necessity,

interfering with those organic processes on the continuance of which life depends. Nitrous oxide acts, not in this way, but by suspending for a brief period one of the most important of the organic processes—that of respiration itself. For the reason named, the insensibility produced by the gas is afforded during an interval of partial death. This interval, transient, doubtful, dangerous, may allow an operator time for a short operation, and, the agent away, the suspended function may return. Usually the suspended function does return, more frequently, in truth, than could be expected, but not always, as we now know by lamentable proof.

We cannot conclude this notice without expressing our cordial sympathy with Mr. Browne Mason. We believe the same catastrophe would have occurred whoever had been the administrator of the gas. We feel sure that he did everything that skill, prudence, foresight, and experience could suggest, and we rejoice that the jury were unanimous in their expression of the same sentiment.—*Lancet, Feb.* 1, 1873, *p.* 178.

110.—BISMUTH AS AN EXTERNAL APPLICATION IN SKIN DISEASES.

A correspondent writes:—"The value of bismuth in alleviating the intense itching and irritation which accompanies chronic eczema and other forms of skin disease is less known than it ought to be. In some obstinate cases, in which the inflamed condition of the derma is aggravated and kept up by the constant scratching and rubbing which the patient finds it impossible not to indulge in, I have found an ointment containing bismuth in the proportion of half a drachm of the subnitrate to the ounce of simple ointment, rubbed up with a little spirits of wine, and applied freely to the skin, give great relief. I was indebted to a work by Dr. McCall Anderson for the suggestion, and have certainly found the ointment far more efficacious as a soothing remedy than the benzoated zinc ointment more commonly used. Dr. McCall Anderson, in recommending bismuth, observes that the ointment must not be made with benzoated lard, or the reverse of a soothing effect may be produced."—*Med. T. and Gaz., Jan.* 18, 1873, *p.* 71.

111.—ON THE USE AND ABUSE OF ATROPINE.

By R. Leibreich, Esq., Ophthalmic Surgeon to St. Thomas's Hospital.

[In this paper Mr. Leibreich relates the accumulated experience of his special branch of practice, and intends it especially for "those who, while actively engaged in general practice, have

no opportunity of entering into the minute details of every department of such a comprehensive science." Speaking of the treatment of iritis, he observes that it is of the greatest importance to apply the atropine in proper quantity.]

Iritis.—In simple cases, a proper use of atropine would be sufficient, even without any other treatment, to produce a most favourable result. In more severe cases, even with the most energetic and careful treatment, a perfect result could not be obtained without a proper quantity of atropine.

How is this local application of atropine to be regulated? The strength of the solution is of little importance provided that it be not too weak. The necessary quantity is determined by the number of applications, or rather by the time during which we enable the cornea to absorb the atropine by keeping the conjunctival fluid saturated with the alkaloid.

Suppose that, for the sake of simplicity, we use in all cases a standard solution of four grains of atropine to the ounce of distilled water, and that each application consists in the instillation of one or two drops, unless the lachrymal secretion be very abundant, and then a little more should be used. Then the principal question to decide will be, how many times daily, and at what intervals to repeat this application? It makes, indeed, no difference at all whether we put in several drops or a large quantity of the solution at one time, and it always reckons as one application; on the contrary, two drops administered at an interval of five minutes or longer have a double effect, and are reckoned as two applications. Because in this way the conjunctival fluid has atropine mixed with it for a longer time, and, therefore, a larger quantity of the alkaloid penetrates the cornea to mix with the aqueous humour. As a rule for the number of such applications, we can only say that the pupil should be completely dilated as soon as possible, and that this dilatation must be maintained during the whole progress of the inflammation, and even for several weeks after it has abated. For this purpose, the quantity required for different cases varies so exceedingly that it is quite impossible to fix dogmatically a definite amount. To keep up this dilatation it is in one case sufficient to go on with one application daily, whilst in other cases three, four, or more applications are required, and only after several weeks it becomes possible to descend to one application daily, or the pupil contracts again and new adhesions are formed. Each case must be judged by itself, but, of course, experience in estimating the amount of inflammation assists one to an approximate conclusion.

In the great majority of cases we find no difficulty in carrying out the afore-mentioned plan of treatment. But iritis being such a very frequent disease, even the exceptional

cases in which we meet with difficulties in applying atropine are still very numerous.

These difficulties depend upon the following conditions:—

Too great intensity of the inflammatory process.—Under these circumstances, atropine will sometimes not be tolerated; it increases the inflammation, and cannot produce the desired effect. Then it is necessary in the first place to give derivatives, and in strong individuals to reduce the intensity of the inflammation by bloodletting, and after that only to apply the atropine. The inflammatory symptoms become seldom so intense spontaneously, but they are sometimes increased to such an extent artificially, by wrong treatment. This happens especially in consequence of the application of cold, and the lotions generally used for conjunctivitis, such as nitrate of silver, sulphate of copper, sulphate of zinc, &c., which artificially increase the iritis.

To mistake iritis for conjunctivitis, which, I am sorry to say, too often happens, gives us an opportunity of observing this fact.

Excluding the afore-mentioned applications generally suffices in such cases to subdue the inflammation, and then the use of atropine becomes again possible.

Cold compresses are always to be avoided in all forms of iritis, and in all stages of the disease without exception. But warm applications are, not only in rheumatic cases, but also in other forms of iritis, very beneficial, and I decidedly prefer the application of dry warmth to warm poultices. I use myself generally warm wadding, and in other cases cotton wool saturated with aromatic oil, which is the same kind of thing as was formerly used.

Adhesions already completely organised.—In the majority of cases of iritis which come under our treatment, not quite at the commencement of the inflammation, we find the margin of the pupil here and there already fixed to the capsule. But at the commencement this adhesion is not so firm, and quickly yields to the action of the mydriatic provided that it is used in sufficient quantity. But if already some time has expired, the separation cannot be made, especially if there are extensive adhesions, with thick exudations fixing it to the capsule; nevertheless, we must give it a fair trial, the more so as it is very necessary to prevent further progress of the adhesions by the separation of that portion of the pupillary margin which still remains free from the capsule.

However, I differ from this rule, and from the generally accepted method of treatment of those relapses of iritis in which, after an insufficient use of atropine in earlier attacks, a complete or nearly complete adhesion of the margin of the

pupil to the capsule has taken place. In such cases I renounce at once the application of atropine, as I know from a comparison of several cases that the remedy will not only not produce the desired effect, but that it will increase the intensity of the attack by its useless action upon the iris. Warmth, derivatives, and the usual constitutional treatment, will in such cases subdue the inflammation quicker without the use of atropine. If abundant exudation in the anterior chamber, effusion of blood, or hypopion exist, as may happen in cases of relapsing iritis, then, as was before mentioned, paracentesis should be employed. I cannot recommend an iridectomy in the acute stages of inflammation. This operation should be deferred to the intervening periods. And even where the urgency of the symptoms require it, we may perform a preliminary paracentesis, because, after the termination of the inflammation, the conditions for the iridectomy are more favourable.

Keratitis.—The important indications in the treatment of iritis, viz. to put out of action the sphincter of the pupil, and to remove the margin of the pupil away from the capsule, does not exist in the treatment of keratitis; but there still remains a very important property of atropine for the treatment of these diseases, viz., to diminish the sensibility of the cornea, to relieve intra-ocular pressure, and to promote a so-called antiphlogistic effect, by its influence upon the distension of the deeper vessels.

Therefore, atropine is to be applied immediately in all fresh cases of keratitis. But the dose is much smaller; one or two drops daily are sufficient. Excepting, first, those cases in which so copious a discharge of tears takes place that the solution will be very soon washed away. Secondly, all forms of keratitis in which the permeability of the cornea is diminished. Thirdly, those cases of keratitis which are characterised by an intense injection of the deeper vessels and by the tendency to be complicated with iritis. In these varieties it is sometimes necessary considerably to increase the dose of atropine for a short time, but it is advisable to diminish it so soon as the pupil is fully dilated.

In the common forms of superficial keratitis, such as pannus, phlyctenulæ, little infiltrations, small superficial ulcerations, I stop the application of atropine at once as soon as a single application produces an effect for twenty-four hours. I then proceed in all the above-described forms of disease (but on no account in parenchymatous keratitis) immediately to apply nitrate of silver. This is in opposition to the usual mode of treatment, but I always found it followed by a most favourable result.

The rule, viz., to administer the atropine so as to dilate the

pupil, and so soon as it remains dilated by a small dose for twenty-four hours to commence the solution of nitrate of silver, appears very empirical; but it is founded on this, that even the rapidity, the facility, and the duration of the effects of the atropine give a correct indication of the intensity of the deeper irritation. In the latter nitrate of silver will not be tolerated, but it acts very favourably as soon as the deep irritation has subsided.

Only in parenchymatous keratitis do I continue the use of the mydriatic for some time after the cessation of the deep irritation.

Operations.—1. *Extraction of Cataract.*—The dilatation of the pupil before the operation is not absolutely necessary, but desirable. Immediately after the escape of the fluid of the anterior chamber the pupil contracts; but we do not thereby lose the benefit obtained by the before-procured dilatation, because without atropine the contraction would be much stronger. Another advantage consists in knowing the degree of dilatation of the pupil that can be obtained in every case, for, especially in old people, with otherwise normal eyes, this varies considerably. *After* the operation the effect of atropine is partly prophylactic and partly therapeutic. With regard to the latter, we must refer to the instructions given for the treatment of iritis. With regard to the prophylaxis, we must proceed in a very different manner, according to the individual cases and according to the method of the operation. For my method of extraction I have made many comparative experiments, and have at last found it most desirable to put the atropine in on the second day, usually a single drop, and not to repeat it so long as the pupil remains dilated. Only in the rare cases in which it is impossible to remove completely the remains of the cortex do I put in a drop of atropine immediately after the operation, and again after the first twenty-four hours. But if unexpected irritation should arise I apply the atropine at once, energetically.

This and the dry bandage constitute, almost without exception, the whole of my after-treatment.

2. *Discission.*—Whether we perform this operation in cases of secondary cataract, partially absorbed or completely softened cataracts, it is always necessary, before the operation, to dilate the pupil, and energetically to keep it well dilated by a prophylactic application of atropine. Difficulties in the application of it, such as we have already mentioned when describing the treatment of iritis, must be well considered beforehand, because they may give, under certain circumstances, a contra-indication for discission, and compel us to extract.

If after the discission a considerable swelling of the lens

takes place, so that the resulting irritation of the iris cannot be overcome by the strongest possible dose of atropine, this gives an urgent indication for immediate extraction of the lens, after which the atropine will regain its lost power.

3. *Iridectomy.*—In an operation so variable it is not possible to establish a general rule for the use of atropine. We must, therefore, indicate a few of the leading points with reference to it. In the operation itself there is neither an indication to apply the atropine beforehand nor after the operation for prophylactic or therapeutic purposes. In an artificial pupil made only for optical reasons it is unnecessary; for glaucoma, where the therapeutic effects of the iridectomy is intended, atropine seems to me decidedly injurious.

I should object, also, for the reasons mentioned under iritis, its application in cases of iridectomy with total and completely fixed adhesions of the pupillary margin to the capsule, or to the corneal cicatrix. But an energetic application of the mydriatic in other cases, immediately after the iridectomy, may be of great use; thus, for example, in adhesions which are limited to one side of the pupil, but cannot be entirely included in the operation of iridectomy, so that on one or both sides of the artificial pupil small adhesions remain. Sometimes we succeed in removing them after the iridectomy by the use of atropine. Sometimes, also, the atropine produces an effect after the iridectomy, which could not be done before the operation, in such cases as hypopion keratitis with consecutive iritis. In these cases the effects will be facilitated by removing the exudation from the anterior chamber, and also by excising a portion of the adhesions, and, lastly, by diminishing the inflammatory state of the deeper parts following the operation. —*St. Thomas's Hospital Reports*, 1873, *p.* 183.

112.—ATROPINE AS AN ANTIDOTE TO OPIUM.

By Dr. James Johnson, Medical Officer to the Chinese Hospital, Shanghai.

Without entering into detailed remarks on individual cases, I may observe that, on every occasion when atropine was injected, the patient was at that time, or very shortly afterwards, in a state of the most profound coma, and utterly insensible to the cold douche, galvanism, or any other remedial measures, and the general condition was as follows :—Pupils firmly contracted to a pin's point, and immovable; conjunctiva and surface of cornea insensible to touch; face pale; lips, eyelids, and nails livid; pulse weak and irregular; respiration slow and stertorous; extremities cold, and the state of the body generally such

as to give it the appearance of a lifeless mass. It was in this condition that the wonderful power of atropine showed itself. The quantity ordinarily injected was half a grain, and its effects were, that in from ten to twenty minutes the pupils began to dilate slowly, and after an hour or more the face became flushed, the respiration soft without stertor, the pulse stronger. Within two hours the full effects of the drug were usually manifested—viz., widely dilated pupils, flushed face, hot skin, tranquil, slow breathing, diminished frequency and increased strength of pulse, followed by calm and tranquil sleep, from which the patient was easily waked after three or four hours. The indication for repeating the injection of atropine was the failure of the first dose to produce within two hours the dilated pupil, flushed face, and slow, steady, tranquil breathing. The dose injected varied according to the degree of coma; when very profound, half a grain was the usual dose; when only partial, a quarter of a grain, repeated afterwards if necessary. The action of the atropine was very uniform—dilating the pupil, strengthening and steadying respiration, and lessening the frequency and increasing the strength of the pulse. Of the fatal cases in which atropine was used, the first one reported lived for eighteen hours, and the action of the atropine was very manifest, as the patient partially recovered consciousness, and did not perish from the comatose effects of opium, but from exhaustion following that condition. In the second fatal case the patient was only two hours and a half under treatment, and died from cerebral apoplexy. The third was under treatment a little over two hours, and died from cerebral effusion. The fourth was two hours under treatment, and died from exhaustion. The fifth was under treatment for five hours, and died from convulsions. The sixth also died from convulsions, and was under treatment for three hours and a half. During the past seven years, upwards of three hundred cases of opium poisoning have come under my observation in this Hospital. In the majority, where the patient was brought within an hour or two after swallowing the poison, the ordinary treatment—by emetics, stomach-pump (when required), cold douche, moving the patient about, stimulants and coffee—was successful; but in the worst of cases, when the hapless patient was in profound coma, and insensible to cold douche, galvanism, and artificial respiration, remedies were often of no avail, and the wretched suicide died.

In July, 1869, I first injected atropine subcutaneously in a very bad case of opium poisoning, and although it failed to rescue the patient, I was so struck by its effects that I resolved to make a further trial of it. The class of cases in which the wonderful powers of atropine as an antidote to opium poison-

ing are most marked, is where profound coma exists; and for such a condition I know no other remedy. You may try to drag the patient about, use the cold douche, carry on artificial respiration assiduously, give stimulants of every description; all in vain—the patient remains comatose and lifeless. Administer atropine, and the effects are marvellous: the pupils dilate; the face becomes flushed; the respiration loses its stertorous character and becomes slow and tranquil; the pulse is diminished in frequency and becomes stronger; the patient slumbers peacefully for several hours, and at last wakes up conscious. I have said that all the cases reported in which atropine was used were of a severe kind, and that the treatment by emetics, &c., in milder cases was usually successful; but in some instances I have observed very unfavourable changes set in very rapidly, even in the mildest cases of opium poisoning. This has happened so frequently that I have come to the conclusion that whenever there is contraction of the pupil and great drowsiness after the evacuation of the contents of the stomach and the moving about of the patient for a little, it is always advisable to exhibit a small dose of atropine, so as to bring the system under its influence. I may remark that in no instance have I seen any bad effects following the subcutaneous injection of atropine. After recovery the patients complained of great lassitude, dryness of throat, double vision, &c.; but they usually recovered from these symptoms very soon. The conclusions I have come to with reference to the treatment of cases of opium poisoning are—

1. That in mild cases, when the patient is seen within one or two hours after taking the poison, and is conscious and able to move about, with pupils uncontracted and movable, the ordinary treatment by emetics, &c., will usually suffice for recovery; but the greatest watchfulness and care are necessary, for even in the mildest cases dangerous symptoms speedily set in. As a rule, whenever there is great drowsiness, with contracted pupils, after the evacuation of the contents of the stomach and moving about of the patient, it is advisable to bring the system under the influence of atropine at once.

2. The state of the pupils is of the first importance. Whenever they are firmly contracted to a pin's point, there is danger; although the patient for the time may seem but slightly affected, sooner or later coma inevitably comes on. It is, therefore, advisable in such cases to use atropine at once.

3. That in cases when the nervous centres do not respond to the cold douche and moving about the patient, it is not only useless, but mischievous, to persist in attempts to drag the individual about, as it only increases the exhaustion, which is one of the greatest dangers in cases of opium poisoning. The

treatment for such cases is to place the patient in the horizontal position, and inject the atropine subcutaneously, and, if necessary, assist with artificial respiration, and, in case of exhaustion, to strengthen the circulation by applying warmth and counter-irritation to the limbs, and by the administration of stimulants, such as coffee, ammonia, brandy, &c., internally.

4. That in all cases of profound coma from opium poisoning, with perfect insensibility, firmly contracted pupils, and stertorous breathing, atropine should be exhibited at once, and the patient carefully supported afterwards by the administration of coffee, ammonia, and stimulants.

5. That, when the system is fairly under the influence of atropine, with respiration tranquil, however slow it may be, it is undesirable to interfere by artificial respiration, as it only embarrasses the breathing and interferes with the tranquil sleep which usually follows the exhibition of atropine.—*Medical Times and Gazette, Feb.* 15, 1873, *p.* 175.

113.—ON THE ACTION OF NARCEINE.

The sedative qualities of opium are due to a greater mixture of alkaloids than any other remedial means. Nevertheless, whilst some of these, as morphia and narceine, produce sleep, others, as narcotine and thebain, produce convulsions and cramps. It is obviously, therefore, expedient than when it is desired to produce sleep, morphia and narceine should be administered in a pure condition, apart from those alkaloids which, by their exciting action on the nervous system, would tend to prevent sleep. The best experimental investigations of late times demonstrate that narceine is better adapted for the purpose of inducing sleep than morphia; that it is entirely free from all exciting action, and acts as a pure narcotic. This has been demonstrated by poisoning animals with narceine, when they die in sleep without any indication of convulsions. Similar experiments, though of course not carried so far, have been made on man, and have shown that the sleep produced by narceine differs from that of morphia in its deep and quiet character, and the unexcitability of the body to loud noises or other stimuli.

The phenomena of paralysis and mental debility, remarked as a rule after the use of morphia, are entirely absent after narceine, as are also the headache, feeling of indisposition, and nausea which sometimes lead patients to object to that remedy.

Eulenburg was the first who instituted experiments with narceine. It dissolves in 375 parts of water at 17° C., and it

may be used both as an internal medicine and hypodermically. It is best given, on account of its high price, by the latter method, for whilst when administered internally from one-sixth to half of a grain is required, only one-eighth to one-quarter of a grain is requisite when subcutaneously injected. Since the larger of these doses have no deleterious secondary action, they may be increased if occasion require; indeed it may be given in the same quantities as morphia itself.

Narceine, besides its general narcotic properties, may also be advantageously employed as a local sedative, producing not only temporary alleviation of pain in many cases of neuralgia of peripheric orgin, but also permanent and complete recovery.

Narceine is a highly nitrogenous compound, found only in opium, and forms colourless columnar crystals. It has a bitter pungent taste; it melts at 92° C., and unites with difficulty with acids. With several mineral acids it forms combinations that turn blue on the addition of water, become colourless on the addition of more water, but again become blue on the addition of chloride of calcium.—*Practitioner, Dec.* 1872, *p.* 379.

114.—AMMONIA IN WORKSHOPS AS A PREVENTIVE OF MERCURIAL POISONING.

In a recent communication to the Paris Academy of Sciences, Dr. Meyer made known the excellent results which he had obtained in preventing all symptoms of mercurial poisoning in the looking-glass manufactory of St. Gobain by sprinkling the floor with ammonia. He cannot explain the preservative action of ammonia, and it was accidentally that he discovered this effect; but he states that during the five years that it has been employed at St. Gobain, not one case of poisoning has been observed among the workmen, whilst there is a marked amendment in the symptoms of those who were previously affected. About half a litre of common liquid ammonia is simply to be sprinkled on the floor of the workshop every evening after the day's work.—*Lancet, April* 26, 1873, *p.* 601.

115.—ON THE THERAPEUTIC USES OF ELECTRICITY.

By Dr. Samuel Wilks, F.R.S., Physician to Guy's Hospital.

[Electricity was first used at Guy's Hospital in 1836. The Leyden jar was used to stimulate lethargic organs, but more frequently the isolated stool. The patient who sat upon the stool was electrically isolated, and by his holding a chain attached to the prime conductor became charged with elec-

tricity. Sparks were then drawn from his limbs or spine, according to the part wished to be operated upon. After the introduction of electro-magnetism, or faradisation, fractional electricity fell into disuse, but it appears not improbable that a valuable therapeutic agent was thus abandoned.]

A fresh impulse was given to the subject of galvanism by Remak, who demonstrated the great advantage of the simple continuous battery current over the induced or secondary current, known as faradisation. Remak asserted that in experiments on animals the effects of the two forms of galvanism were very different; and his statements as regards paralysed muscles were soon verified. We therefore at once procured for our electrifying room a galvanic battery of a hundred cells, which was capable of being used of any strength. Our assistant, Mr. Sandy, made also a portable machine, which could be carried through the wards. It was very soon apparent that we had made a very important addition to the therapeutic value of galvanism, for we found that the current passed down the spine would influence the condition of the lower limbs where faradisation had altogether failed; and we found, also, that in various forms of paralysis an effect was not only produced where faradisation was inert, but that in some cases the muscles were more susceptible to its influence than in health. In the first case in which it was employed the effects were most striking; it was that of a man who had a paralysed arm, with a gradually progressing wasting of the muscles. It was quite unaffected by faradisation; but, immediately the continuous battery current was used, contraction of the muscles took place, and from this time a gradual cure was effected. It was exactly the same with a case of lead-paralysis. Here no effect was discernible on the application of faradisation; but, on the other hand, there was an extreme susceptibility to the influence of the primary current.

You must understand that the simple transmission of the current along the spine or limbs produces apparently no result —or at least it has to be yet discovered that a current continuously flowing through any part of the body has any effect either on the muscular or the nervous system. It is only when the circuit is broken or closed that an effect is seen. Thus, in the case of the man mentioned just now with the paralysed arm, one pole was placed on the shoulder and the other was stroked down the deltoid, when, on lifting it from the surface, an immediate contraction of the muscle and elevation of the shoulder took place; and the same occurred again on replacing the electrode. In the case of lead-paralysis, in like manner, one pole was placed on the back of the fore-arm over the upper

part of the extensors, and the other pole lower down; when contact was made or broken, contraction of the muscle immediately took place. In this case, as in similar ones, a smaller amount of galvanism roused the irritability of the muscle than would have been required for a healthy arm. If the hand, also, be placed in a basin of water, and one pole of the battery continually dipped in and taken out, whilst the other pole is fixed on the back of the arm, contractions likewise take place. By using the continuous current in these ways, we are now curing very rapidly our cases of lead-paralysis. As severe an example of this disease as you could well see was that of the woman who lately left our wards, and whose muscles were so wasted that she was obliged to keep her bed, and was unable to lift her arms to feed herself; yet by persevering in this form of galvanism for three weeks she completely recovered. It is the continuous current which is probably most useful in infantile paralysis.

As regards its application in cases of paraplegia, we place one pole on the upper part of the spine towards one side of the neck, and the other pole on the lower dorsal region, and as often as the circuit is opened or closed a sensation is experienced. At first the effect is stimulating, and afterwards it is soothing. A sensation of warmth is experienced through the whole body, followed sometimes by sweating; and if the current be powerful, it may excite headache and stimulate all the nerves of special sense, causing noises in the ears, sparks in the eyes, metallic taste in the mouth, and at the same time often producing an urticarious rash on the back. In a short time the patient feels soothed; if he has had pains in the limbs they are relieved, and he is inclined to sleep. The simple battery current appears to rouse the dormant power of the cord, and is thus curative in various forms of paraplegia where no organic disease is present. Thus it has been found to be most valuable in some cases of paralysis of motion or akinesia; but it is more especially in cases of want of control or ataxia that its effects have been most marked. In some very severe and chronic cases, where there was reason to believe, from the duration and intensity of the symptoms, that some degeneration of the posterior column of the cord must have existed, a complete cure has been effected. In one case where progressive muscular atrophy had commenced, the disease was arrested by the same means; and in one case of paralysis agitans, where galvanism has hitherto failed to produce any benefit, it seemed as if the patient were deriving good from its use.

The soothing effect of the battery current is most striking. Thus, in the cases of ataxia of which I speak, pains in the limbs exist as a common symptom, and these are much relieved by its

use. In other cases where the paralysis is irremediable, the sedative effect of galvanism has been sufficient to determine its continued use. Thus, in a man now in the hospital with a permanent contraction of the legs from chronic meningitis, from which it is not likely that he will ever recover, so much relief is obtained by the application of the galvanic current to the legs, that the man asks for it in order that he may procure sleep. I can recall several cases of various forms of paralysis where galvanism was most useful in relieving pain and restoring sleep. In simple and pure neuralgia, I can quite corroborate what others have said as to the value of galvanism, and more especially of the primary battery current. I have known faradisation to cure lumbago, but it is the other form of galvanism which has been attended by the most marked success. The relief obtained is generally immediate, and in some cases of frontal neuralgia one application has been sufficient. In longer standing cases, as in that of a woman who was in the clinical ward, a neuralgia of the face, of months' duration, was cured in a fortnight. Since this, we have had two somewhat similar cases.

The greatest disappointment which I have experienced hitherto has been in spasmodic affections of the muscles. In old cases of contraction of the limbs, due to organic change in the centres or nerves, no cure could be expected; but in the temporary and functional forms it might have been hoped that in galvanism we had a speedy means of relief. This has not been so, however, in my experience. I have had the case of a contracted arm in a girl which, for want of a better name, we called hysterical, and in her we used galvanism most perseveringly; we tried both forms, and in various modes, reversing the currents and operating on both the affected and unaffected muscles, but with no success. It was just the same with the case of wry-neck lately in the hospital. The man had galvanism most unremittingly applied to the contracted muscle as well as to the healthy ones. It was used in various modes by Mr. Sandy, but only with temporary benefit. If he appeared better for a day or two, he again relapsed into his former state.

We have, therefore, much yet to learn in reference to the uses of galvanism—as to the value of its different forms, as to the intensity and quantity of the force used, and as to the direction of the currents. Since every nerve in a limb contains fibres of two functions—motor and sensitive—whose forces are travelling, we suppose, in opposite directions, it follows that, if a galvanic current be made to run along the nerve, it may favour the action of one of these streams of force and oppose the other. This seems to be the case by experiments on frogs and other creatures, where a galvanic current passed down the leg will cause contraction of the limb, whereas if the poles be reversed

the animal will cry out, and every muscle of the body will start. This experiment would seem to show that direction should vary according as we wish to affect a motor or sensory nerve. At present we simply test the different modes of application on our patients, and treat them accordingly.

As regards the different effects of the primary and secondary currents, it has been suggested that these are due simply to the fact that the one is continuous and the other interrupted; therefore, that if the battery-current were broken, it would be found that a muscle or nerve could take cognisance and be affected by it (supposing the susceptibility to faradisation had been shown), whereas if it flowed simply though these structures it would pass unfelt. We have tried the experiment, but hitherto without the result expected; and therefore for the present we have been obliged to regard the two forms of galvanism as practically different. Then, again, it is said that the battery-current acts directly on the nerves, whilst the faradic current acts immediately on the muscle; but a discussion of this matter involves the larger inquiry as to the dependence of the muscle upon the nerve for its contractility. The question has not yet been settled. On the one hand, we observe the contraction of muscle on the application of a stimulus when it is entirely severed from the nerves of the body; and, on the other hand, we know that the muscle gains some kind of stimulation through the nerve, since we observe the dropped face in paralysis of the portio dura, and the falling of the head if sleep overtake us in our chairs. Dr. Marshall Hall believed that whilst a muscle retained its connection through a nerve with the spinal cord its contractility remained, but if the connection were severed this quality was lost. He thus by means of galvanism endeavoured to show the nature of the paralysis. In all probability some of his observations were correct; and no more important question in relation to galvanism can be studied than this, for by making experiments on muscles and discovering the connection between their condition under the influence of electricity, and the integrity of the nerve-centres, we shall be able to use the therapeutic agent as a test. By observing the behaviour of muscles under the influence of galvanism, we may form an opinion as to the state not only of the muscle itself, but of the nerve-centre from which some of its qualities are derived. Of course, when Marshall Hall used the expressions "cerebral and spinal paralysis," he meant in the one case, where a limb was paralysed because cut off from its connection with the brain; and, in the other case, where it occurred from disease of the cord itself. There is no such thing as cerebral paralysis in the sense in which he used it. As a matter of fact, we find, as he asserted, these different effects. Thus there are

now in the wards two cases of paraplegia in which the continuous current, whilst exciting contraction in the one, has no effect on the other.

Another question which we want solved is this: Is the continuous flow of galvanism or electricity through the body of any service? It has been thought that the current passes simply over the surface of the body, and thus must be quite ineffectual in influencing the deeper structures; but I believe such a view has been found to be erroneous, and that a current of electricity may, for example, be made to pass quite through the brain. We require often not only to put more life into a portion, but into the whole of the body, as, for example, into that of a little child who may be lying completely powerless after an attack of chorea. Now I believe Pulvermacher's chains are supposed to act in this manner—that is, by simply supplying a stream of electricity to the body. I have seen these instruments much in use, but I cannot say from my own observation that I have ever witnessed much good accrue from them. We are, however, about to make a machine which the patient can wear on his back, and thus I hope we shall soon be able to solve the problem. Since the effect would not be immediate, the method must be long continued. We have also been making experiments with an electric bath, but at present the results are doubtful. With respect to other uses of galvanism, as in cure of aneurism, as an actual cautery, &c., I leave them to be treated of in their special departments.—*British Medical Journal, Jan.* 11, 1873, *p.* 29.

116.—ON THE USE OF THE DIRECT AND INDUCED CURRENTS OF ELECTRICITY.

By Dr. Walter G. Smith, Assistant Physician to the Adelaide Hospital, Dublin.

Among the more recent and positive gains to electro-therapeutics we can fairly reckon the better discrimination as to the respective functions of the induced (so-called *interrupted current*), and of the direct (or so called *constant* or *continuous current*), and the indispensableness of the latter in certain cases of paralysis; the use of electricity in laryngeal affections, and the more certain relief and cure of severe forms of neuralgia and of some conditions of perverted sensibility; the wide diffusion of a correct knowledge of the methods of electrization; the application of electricity to diagnosis and prognosis, a subject most unjustly ignored in ordinary practice; the proved possibility of directly galvanizing the brain and spinal cord; and, lastly, the utilization of electricity in surgery for its heal-

ing powers, or for its chemico-vital effects in causing coagulation of the blood, and in producing discussion of tumours.

Any reference to "general faradization," and the so-termed "galvanization of the sympathetic" is designedly omitted, for these methods do not appear to me to rest as yet on a sufficiently sound foundation. Niemeyer, whose opinion is justly entitled to respect, and who certainly cannot be charged with credulousness, was firmly convinced "that the introduction of the constant current into practice is one of the most valuable advances of modern times, and that *in the constant current* we have a means more powerful than any other of modifying the nutritive conditions of parts that are deeply situated." And it seems to me, that this vital influence of electricity on nutrition has scarcely obtained the attention which it merits, and that in our practice and teaching too exclusive a part is ascribed to the merely stimulant action of the current on nervo-muscular tissue. Electricity is a muscular stimulant, but it is something more.

Bell's Paralysis.—Case 1. Mr. O'F., a medical student, aged twenty, applied to me in May 1870, for right facial paralysis, contracted four days previously after exposure to cold air. Next morning he found that he could not spit straight, and the usual signs *gradually* developed, although without much oral distortion, and at first there was numbness along the right side of the tongue; hearing was more acute on the paralysed side, and he could not retract the right ear. As to treatment, it is sufficient to state that both the direct and the induced currents were used, that the muscles rapidly regained their functions after seven or eight applications, but for some time afterwards the tears had a tendency to escape from the eye, and he could not whistle so perfectly as before the accident. In the commencement twitchings occurred in several of the muscles, especially the orbicularis oculi. In the course of treatment I observed a circumstance which was new to me at the time, and which is, at least, quite the exception. It is commonly stated that, at any rate after a few days, the muscular contractility to induced electricity is below par in the paralysed side, or may even be abolished altogether, and that this condition will even enable us to diagnose an eccentric facial palsy from one of central origin, in which the electric contractility is preserved intact. As a nearly universal rule this is, no doubt, true; but in this case the paralysed muscles uniformly responded to a weak induced current, and also to a moderate direct galvanic current *more actively than the healthy* muscles for about a week, after which contractility became normal.

Case 2. In Dec. 1870, Miss P. called on me, by Dr. Stokes' advice, for incomplete right facial paralysis contracted five weeks previously. Even on the first trial she could nearly close

the eye under the influence of a gentle primary induced current, but both galvanic and faradic excitability were decidedly diminished, and the current was less felt on the paralysed side. Yet after a short time (three weeks) the galvanic excitability was heightened, for six (Leclanché) cells caused vigorous contractions on the paralysed side and none on the left side, and what is more remarkable, the current from a *single cell* evoked unmistakeable contractions of the paralysed half of the sphincter oris. The progress of this case was unusually tedious. Excitability to the induced current was very slowly regained, and even when motility was nearly perfect and the facial distortion had disappeared, the paralysed muscles responded more to a direct galvanic current and less to the induced current than the healthy muscles. Rapid interruptions of the direct current by the hand caused *tonic* contractions of the muscles. The treatment extended over about two and a half months, and perhaps some reason might be found for this in the fact that the paralysis had set in with pain, had existed for more than a month before treatment was commenced, and occurred in a lady of a highly nervous and excitable temperament.

Lead Palsy.—On this affection I shall make but one or two remarks, without detailing any cases. In two instances within the past year, I have seen more or less paralysis of the legs as well as of the arms, and one of the patients walked at first with a staggering gait, not unlike that of "ataxy." The gravity of the paralysis certainly seems to bear no constant relation to the degree of muscular atrophy; for it will, I think, be found that every grade of paralysis may occur with or without much atrophy of the muscles, and cures will undoubtedly be effected even when the contractility of the muscles to induced electricity is apparently quite lost. In severe cases, although the patient may be so far relieved that he is able to return to his work, the palsied muscles seldom regain their full bulk and vigour. Flabbiness and want of consistence of the muscles is a simpler and probably nearly as good a test of their vital condition as electric contractility, and the sensibility of the skin and muscles, so far from being always impaired, seems often to be exalted, and muscular faradization by a moderate current is frequently attended with a deep-seated acute pain.—*Dublin Journal of Medical Science, February*, 1873, *p.* 161.

117.—A NEW ANODYNE COLLOID.

Dr. LACKERSTEIN, of Queen Anne Street, has favoured us with a sample and formula of what seems likely to prove a useful application in neuralgic and other localised pains. The

composition is as follows:—R. Amyl. hydrid. ℥j.; collodion (B. P.), ℥j.; aconitiæ, gr. j.; veratriæ, gr. vj. This forms a colloid which should be brushed over the painful part five or six times, forming successive films. If the pain be not at once relieved, the absorption of the alkaloids may be favoured by covering the colloid film with a layer of spongio-piline.

We have tried the remedy, with good, though not conclusive, results, in two cases of supra-orbital neuralgia. It certainly seems worthy of extended trials.—*Practitioner*, *Jan.* 1873, *p.* 63.

[Dr. Lackerstein says: "It has given me very satisfactory results in neuralgia, sciatica, lumbago, and all muscular pains, &c. It relieves local pain for the time, and procures a good night's rest, while, of course, the internal treatment appropriate to each case is carried on. The amyl hydride is the only new ingredient; but I think the colloid is a clear and elegant preparation."]

118.—TINCTURE OF VERATRUM VIRIDE IN ACUTE RHEUMATISM.

By Dr. William Carter, Physician to the Liverpool Southern Hospital.

In the last (5th) volume of the Liverpool Med. and Surg. Reports is a short notice of three consecutive cases of acute rheumatism, treated by the administration of two minims of the tincture of green hellebore every hour, until the pulse was reduced to its normal degree of frequency, when the dose was diminished to one minim. In all three instances, the patients made remarkably rapid recoveries. I now add a fourth, the only other instance of really acute rheumatism that has been since admitted under my care. Like them, it shows the remarkable power which the drug in question possesses of steadily reducing the frequency of the pulse hour by hour; and, like them also, this case was of remarkably short duration. The record of many more cases than these (and of an equal number previously published by Dr. Silver, Physician to Charing Cross Hospital) is required before it would be safe to say that veratrum viride, when thus administered, had a manifest advantage over other drugs in cutting short the duration of acute rheumatism; but, at any rate, the results are sufficiently encouraging to make it desirable to continue the observations.

T. B., æt. 25, a labourer, was admitted into the Southern Hospital, under my care, on July 20th, 1872, suffering from acute rheumatism. He gave the following history:—After a life of health, he had begun, a month before admission, to suffer

from slight rheumatic pains. On the night of the 17th July, the right knee was attacked by very acute pain, followed by much swelling, and accompanied by general fever. Other limbs became similarly affected, and he grew rapidly worse until his admission. He had been taking medicine before coming to hospital. He was a large, well-built man, but entirely helpless. Most of the joints were affected, and intensely painful. He was sweating very profusely, and the sweat had the usual sour smell. Tongue covered with a white fur. Temperature 102$\frac{4}{5}$° F. Pulse 112. He began taking the tincture immediately; but, by a mistake of the nurse, it was only administered every fourth hour. The next day, the pulse was 92, and the temperature 103$\frac{2}{5}$°. The dose was now given every hour; and in twenty-two hours afterwards the pulse had fallen to 82; the temperature being 102$\frac{4}{5}$°. On the following day, the 23rd July, the pulse was the same; while the temperature had risen one degree. At 2 p.m., on the 25th July, the pulse was at 68, and the temperature 101°. He was reported to feel "no pain, but much stiffness." On the 27th July, he is stated to be "still better; to be sweating much less; and to be almost entirely free from pain. Pulse 70. Temperature 100$\frac{1}{5}$°." On the 29th July, the medicine was discontinued, as he seemed to be well. He remained in the hospital until August 6th, taking quinine and iron. There was no relapse, and on that day he left. Besides the tincture of green hellebore, he had four fifteen-grain Dover's powders, one on each of four nights, and one black draught.—*Manchester and Liverpool Medical and Surgical Reports*, 1873, *p.* 43.

119.—LOCAL EMPLOYMENT OF CHLORATE OF POTASH IN CANCEROUS SORES.

In the "Berl. Klin. Wochenschrift," No. 6, 1873, Dr. Burow, of Könisberg, advocates the local employment of chlorate of potash in the treatment of cancerous sores. His proceeding consists in sprinkling the sore with chlorate of potash in powder or crystals, and covering the whole with a wet compress. As the crystals of chlorate of potash exert a more powerful action than the powder, and excite greater pain, Dr. Burow uses the powder first, and replaces it by the crystals when sensibility has been abated. One of the cases was a cancerous sore of the left arm, which healed completely after eight weeks' treatment. Three other cases were cancerous sores of the breast; one was lost sight of, the other two are under treatment, and healing well. The fifth case recorded was connected with a cancer which originated in the periosteum of the upper

jaw and left cheekbone, and then became ulcerated; in this case healing was complete in three months.—*Lancet, April* 12, 1873, *p.* 525.

120.—CLINICAL REMARKS ON THE RESINA COPAIBÆ AS A DIURETIC.

By Dr. S. Wilks, Physician to Guy's Hospital.

Dr. Wilks speaks with the greatest confidence of the value of the resin of copaiba as a diuretic. The ordinary copaiba has long been known for its action on the kidney, and is occasionally used in dropsy, but the nauseous taste of the oleo-resin has almost forbidden its employment. The oil separated from the resin is officinal, and is often prescribed in gonorrhœa instead of the compound substance. It is thought that the oil acts more especially on the mucous membranes, and is therefore useful in affections of the bronchial, vesical, and urethral surfaces. If this be so it is equally certain that the diuretic properties reside in the resin. Dr. Wilks has found it very difficult for patients to take the ordinary pharmacopœial drug, and almost impossible to get general practitioners to sanction its administration in private practice; he therefore has substituted for it the simple resin, and finds it equally or more efficacious. He gives fifteen or twenty grains in mucilage and flavoured water three or four times a day, and has had numerous cases showing its marked diuretic properties. There is now in Guy's Hospital a man who came in with ascites, and who, after taking numerous other remedies, was ordered the resin. The amount of urine was at once doubled in quantity, and now, after a few days, the fluid has almost disappeared. Dr. Wilks says he has lately had as a private patient a "drunkard builder," with cirrhosis of liver and enormous ascites, for whom he likewise prescribed the resin; a diuretic action was at once effected, and the dropsy quickly disappeared. In heart cases, also, he has given it with great success. Lately there was in the hospital a girl with mitral disease and considerable dropsy, who took the usual medicines without effect, and was then ordered the copaiba. It at once produced the desired result, and the fluid was dispersed. Dr. Wilks states that he has often given the remedy and failed; but, on the other hand, when it has succeeded the result has been more striking than that arising from any other diuretic he has seen. He would wish it were placed in the Pharmacopœia, as it is not kept by chemists, although he is informed that it is used largely by perfumers, and the resin thrown away in large quantities as a waste material.—*Lancet, March* 22, 1873, *p.* 410.

121.—THE ABSORPTION OF TOBACCO SMOKE.

By Dr. Charles R. Drysdale, Senior Physician to the Metropolitan Free Hospital of London.

Every one knows that the chief injurious effects of tobacco are due to the nicotine contained in it. Hence, the importance of considering whether tobacco smoke contains nicotine. Now, Melseus collected from 4,500 grammes of tobacco smoke passed through water, 30 grammes of nicotine. Dr. Le Bon in the Giornale Veneto dei Scienze Mediche S., iii, 1872, remarks that the fact of nicotine been absorbed by smokers is proved not only by the injurious effects on the organism, but also by other circumstances. The alkaloid is soluble in water and in the fluids of the mucous membranes; smoke condensed and mingled with water becomes easily absorbed. As to the quantity of incotine absorbed in smoking, science has as yet nothing exact to mention, since this varies according to the kind of tobacco used and the circumstances under which it is used.

Besides nicotine, tobacco also contains ammonia in notable quantity, which is taken up by the mouth and lungs. When cigars are smoked the constituent parts of the tobacco are turned into the form of vapour. A part of the smoke spreads itself over the cool tobacco leaf near the mouth, another part comes in contact with the cool mucous membrane of the mouth, where it is condensed and absorbed. The rest is spread about in the air. The further the burning process of the cigar proceeds, the moister does the tobacco leaf become, the more smoke arrives at the mouth, and becomes absorbed, so that the end tastes bitter, and beginners feel sick from this fact when smoking a cigar to the end.

Hence, it seems that in the smoking of cigars, especially if smoked to the end, a very notable quantity of nicotine and other constituents of tobacco are absorbed, even when smoking takes place out of doors, and the smoker does not inhale the smoke into the lungs. If the smoking take place in closed rooms, then not only are nicotine and the other parts of the tobacco taken up in the mouth, but also with each breath a portion of the tobacco smoke contained in the air of the room. The quantity of injurious substance of course becomes the greater just in proportion as the room is smaller, and there are more smokers. A railway smoking carriage is, of course, the *ne plus ultra* of unwholsomeness in this respect.

Persons who indulge in the habit of first inhaling the smoke, and then expelling it by the nostrils and mouth, take up a much larger quantity of nicotine from the great absorption power of the lungs and other mucous membranes.

When pipes are smoked, even with short stems, there is much less injurious substance absorbed, because the smoke is absorbed in the cool tube, less of it arrives in the mouth, and, as is well known, is found among the ashes of the pipe. The longer the stem, the less of the constituents arrive at the mouth or lungs; hence the advantage of long pipes, and especially of Turkish hookahs, when the smoke passes through water.

With regard to persons who, not themselves smoking, remain in chambers where smoking takes place, they cannot in any way escape the injurious effects of tobacco smoke. If they do not inhale so much injurious matter as the smoker himself, still they take in on each breath a quantity of the constituents of tobacco smoke mingled with air; and to such a degree that he or she who lives in such a room takes in more nicotine than a smoker does who smokes only in the open air.

Hence, it appears, that women who serve in public houses and cigar divans, are materially injured by a vice which their own sex is innocent of; and this fact may, perhaps, restrain, some good-hearted male, who is quixotic enough not to care sufficiently for his own health.

It is now well known by the observations of Dr. Kostral in the Austrian State tobacco manufactory, that persons employed in tobacco manufacture are subjected to many diseases, especially in the case of young women and boys.—*Medical Press and Circular*, *Feb.* 12, 1873, *p.* 131.

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